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Literacy and Numeracy in Play: Young Children's Representations of Their Multilingual Worlds

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LITERACY AND NUMERACY IN PLAY:

YOUNG CHILDREN'S REPRESENTATIONS OF THEIR MULTILINGUAL WORLDS

A dissertation submitted in partial satisfaction of the requirements
for the degree Doctor of Philosophy in Education

by

Janelle Elizabeth Franco

2019

ABSTRACT OF THE DISSERTATION

Literacy and Numeracy in Play:

Young Children's Representations of Their Multilingual Worlds

by

Janelle Elizabeth Franco

Doctor of Philosophy in Education

University of California, Los Angeles, 2019

Professor Marjorie E Orellana, Chair

This study explores how young children use literacy and numeracy in play as they represent themselves in their multilingual worlds. Education policies continue to rely on constricted definitions of achievement and monolingual norms, narrowing the kinds of learning experiences available in schools, especially for children living in multilingual and/or low-socio-economic communities. Drawing from a variety of data sources, including field notes, video/audio recordings, photographs, ethnographic interviews, and children's artifacts, this study examines children's literacy and numeracy practices in a play-based after-school program. In addition, ethnographic interviews and participant observations were conducted in the children's classroom and with family members in order to inform understandings of after-school interactions. Analysis of the data revealed how children drew from their translingual resources as

they created representations in their play. This included (1) how children collaborated and negotiated decisions about representation, making choices about when and how to collaborate, and shifting and/or combing languages and modes of representation based on intent and awareness of audience; and, (2) how children used spatial understanding and translanguaging to represent themselves within their play and community, sometimes prompting discussions surrounding mathematical perspectives and audience. This dissertation concludes by discussing how these findings inform theory, hold implications for policy and practice, affect educators' use of play as a tool for teaching and learning.

Keywords: *early childhood, literacy in play, numeracy, translanguaging, multilingual contexts, representation*

This dissertation of Janelle Franco is approved.

Megan Loefe Franke

Mileidis Gort

Lorena I Guillén

Karen Quartz

Marjorie E Orellana, Chair

University of California, Los Angeles

2019

DEDICATION

Para todas las niñas y todos los niños que tanto me han enseñado

To all the children I have worked and played with over the years

To the children who were my partners in this dissertation:
Rosa Blanca, Anthony100, Emita, Ben10, Rambo Bebé, and Natasha Bebé

To my own children, Clay and Marco, who have been my most important teachers

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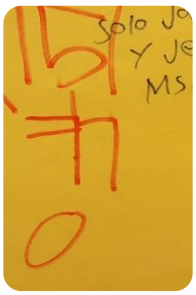

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"Unless someone like you cares a whole awful lot,
nothing is going to get better. It's not."
– *Dr. Seuss*

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Franco, J., Angeles, S., Orellana, M., & Minkoff, A. (forthcoming). Preparing teachers to recognize and expand children's linguistic resources: Addressing language ideologies and practices. *Language Arts*.

Franco, J., Orellana, M., & Franke, M. (2019). "Castillo Blueprint": How young children in multilingual contexts demonstrate and extend literacy and numeracy practices in play. *Journal of Early Childhood Literacy*. https://doi.org/10.1177/1468798419841430

Orellana, M., Franco, J., Johnson, S.J., Rodriguez, B. Rodriguez-Minkoff, A., & Rodriguez, L. (2019). Transforming practice in multilingual communities: Towards a transcultural pedagogy of heart and mind. In P. Pacheco & Z. Morales, (Eds.), *Transforming schooling for second language learners: Policies, pedagogies and practices*. Charlotte, NC: Information Age Publishing.

Franco, J., Rodriguez, L., & Orellana, M. (2019). Creando espacios para expandir el conocimiento y entendimiento a través del diálogo entre niños, estudiantes universitarios e investigadores. *Decisio* (51). CREFAL. Pátzcuaro, México.

Franco, J. & Pérez-Swanson, G. (2019) *Nurturing play: How schools can provide powerful opportunities for children to learn. Alentando el juego: Cómo las escuelas pueden brindar oportunidades valiosas de aprendizaje para los niños* . UCLA Center for Community Schooling [Policy Brief 1-BR-W19].

Orellana, M., Johnson, S.J., Rodriguez, A., Rodriguez, L., & Franco, J. (2017). Pre-service teachers learning to see and seeing to learn. *Teacher Education Quarterly,* vol. 44, No. 2 (Spring 2017).

Franco, J. & Orellana, M. (2017). Review of Barbara Comber's *Literacy, Place, and Pedagogies of Possibility*. *Journal of Early Childhood Literacy*, vol. 17(1), 137-143.

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Franco, J. (November, 2018). *Representation across borders: Exploring young multilingual children's literacy and mathematical practices through play*. Literacy Research Association Conference. Indian Wells, CA.

Franco, J. (November, 2018). *Representing worlds through play: Early literacy and numeracy in multilingual contexts*. American Anthropological Association Conference. San Jose, CA.

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CHAPTER 1: INTRODUCTION

"Mira, acorns!"[1] exclaim Rosa and Rambo Bebé[2] as they run toward us from under a tree, each holding up an acorn. The other children gather around to look at the acorns, standing on the upper field near the outer fence. Beyond the fence is the cityscape, buildings and signs punctuated by a tall office building that towers over the playground, the word "EQUITABLE" written in massive letters on its upper facade. Rosa and Rambo Bebé wave the others back to the tree to look for more acorns, which leads the group to begin collecting them together. The children begin placing the acorns in a pile, adding more and more. "That's a lot of acorns," says Ben10. Rosa looks to another area and says there are more: "Acá hay más acorns." Rambo Bebé agrees, "Sí, allí hay muchos." Some of the children begin describing them. Rambo Bebé adds more acorns to the pile and says one is "a little, baby acorn." Anthony100 picks up another and says, "A green one." Rambo Bebé points and tells Rosa there are more baby ones: "Más baby acorns." Later, Ben10 asks how many acorns we have and suggests taking a photo. Rosa says it would be better to count them. After starting to count together, Rosa and the others decide it would be more productive to take turns counting then checking. Anthony100 suggests writing down the number so we don't forget. Some of the children want to tell the after-school teacher how many we have. The following week some of the children count the acorns after having collected more, and others draw pictures of their small collections in the journals. Rosa and Rambo Bebé count in Spanish, and Emita counts in English. They verify that they counted the same amount. On the top of the page of his journal, Anthony100 draws five acorns with a corresponding label and includes a drawing of himself. "This is me looking down at the acorns," he tells me. I ask him why he wanted to draw a picture of them, and he tells me, "to remember them and show my mom."

The interaction described above took place in an after-school program located in a linguistically diverse neighborhood in Los Angeles. These kindergartners, like other children

[1] Martinez, Durán, & Hikida (forthcoming) discuss "expanding what counts – and who counts – in academic writing." With this in mind, I aim to write this dissertation in a style that reflects the language practices of the children in this study. For this reason, I do not italicize Spanish language as it is not separate from these children's linguistic repertoires, nor do I write out direct translations. My hope is that readers who do not speak Spanish will be able to understand the Spanish quotes and terms in the context of the surrounding English phrasing, and that bilingual speakers will find the English explanations of the Spanish text to be additive, rather than repetitive.

[2] Children's names appear as pseudonyms, which they themselves chose.

growing up in multilingual communities, used their linguistic and numeric resources to make meaning in their play. They coordinated and negotiated their efforts in creating representations that reflect their multilingual worlds – and positioned themselves in those worlds.

Examining children's play, we can see a range of practices that involve complex social, cultural, linguistic, cognitive, and mathematical competencies. Here, while collecting the acorns, the children demonstrate an understanding of putting together parts to make a whole, making sense of how many they have, and what constitutes their collection. They show an understanding of representation as they both negotiate and coordinate their efforts with multiple languages (English and Spanish) and modes (i.e., using gestures and spatial drawings) to document the quantity and descriptions of their collection while positioning themselves within the context.

Children explore their worlds through play. In their play, children can draw from their imagination and own experiences to "tap into their passions and expertise" (Wohlwend, 2011, p. 3) as users of literacy and mathematics. "When children have time, space, and opportunities to experiment and discover, their capabilities to communicate, make decisions, problem-solve, and make connections expand as well," argues Adair (2014, p. 233). Although research shows that immense learning happens through play (Fisher, Hirsh-Pasek, Golinkoff, Singer, & Berk, 2010; Wager & Parks, 2016), governmental policies continue to rely on constricted definitions of achievement, limiting playful learning in pre-kindergarten and elementary classrooms (Miller & Almon, 2009; Pellegrini & Bohn, 2005; Wohlwend & Peppler, 2015). These education policies have created high-pressure conditions, leading early childhood educators to re-prioritize what and how they teach (Genishi & Dyson, 2012; Graue, 2008), narrowing the kinds of learning experiences available in schools to emphasize short-term cognitive gains (Fuller, 2007; Kagan & Lowenstein, 2004; Stetcher, 2002). The consequences of this shift have been especially severe in

multilingual and low-socio-economic communities. As Adair (2014) argues, “For children from marginalized communities, the loss of learning experiences that emphasize experimentation, discovery, exploration, open-ended discussion, critical thinking, problem-solving, project design, or initiative has been disproportionately devastating” (p. 218).

While our education standards continue to reflect a monolingual norm, many children, families, and educators do not live in a monolingual reality. There has been a worldwide increase in immigration over the past two decades, with more people moving from, through, and to more places (Vertovec, 2009). With this movement we find communities filled with what Vertovec (2007) calls “super-diversity” or the “dynamic interplay of variables among an increased number of new, small and scattered, multiple-origin, transnationally connected, socio-economically differentiated and legally stratified immigrants” (p. 1024). With the rise of immigration, we find linguistic and symbol-rich communities that are continuously changing and becoming sites of negotiation as new community members come and go (Orellana & Rodríguez-Minkoff, 2016). Here we find borders being physically crossed and metaphorically blurred. In urban centers, children are exposed to many languages. Currently more children are multilingual than monolingual (Horner, Lu, Royster, & Trimbur, 2011; Kenner & Gregory, 2013) and children who speak more than one language are the fastest-growing population in schools in the United States (National Clearinghouse for English Language Acquisition [NCELA], 2010). However, borders still impose themselves, dividing nations, languages, disciplines, and ideas. Most research on border crossing does not consider children as active agents with their own views and relevant experiences (Orellana, 2016). “In a world controlled by adults, children are often marginalized, second-class persons,” writes Dell Clark (2011, p. 27). Children are at the forefront of linguistic change, but most research is still strongly anchored in a monolingual

stance that rarely considers children's own understanding of how they conceive their multilingual worlds.

When children living in multilingual contexts enter school, they are confronted with a new set of borders: the ones that divide curricula. How do they negotiate these institutional borders and reconcile them with their prior knowledge, experiences, and understandings? How might we create more equitable learning opportunities for these students? How do we make it so that for children growing up in multilingual communities, the word "equitable" is more than just letters etched onto a building towering above a school field?

My research study aims to examine how young children growing up in multilingual, immigrant contexts make sense of and represent their worlds, utilizing their literacy and numeracy practices in their play. The questions that guide this study are:

1. How do children use literacy and numeracy as they play in multilingual contexts?
2. How do children use representations to negotiate borders between literacy and numeracy, and between languages?

Dissertation Overview

In the remainder of the Introduction, I situate language practices in multilingual communities in the broader societal context, elaborate on the discussion of *superdiversity* and borders, and introduce the concepts of *translingualism* and *translanguaging*. I also share personal and pedagogical reflections on language and children, then lay out the significance of this work for learning and the field of teacher education. In Chapter 2, I provide a review of the theoretical frameworks used to guide this study, including "new childhoods," sociocultural theory, ethnomathematics, and multiliteracies. Chapter 2 also includes a review of the literature, including research on acknowledging children's resources, playful learning, and children's

representations. The chapter also addresses the gaps in these research areas. In Chapter 3, I outline the methodological framework, describe the setting and participants involved, discuss the data collection methods and analysis, describe the focal activities, and address methodological limitations of the study. Chapter 4 explores how the children collaborated and negotiated decisions about representation through their play, and how they used translanguaging as a tool for collective thinking. Chapter 5 focuses more specifically on how the children positioned themselves in their maps and drawings. I discuss the importance of spatial reasoning and translanguaging, and how interactions with the children's maps and drawings sometimes prompted discussions about mathematical perspectives and awareness of audience. In Chapter 6, I discuss how findings from this study inform theory in regard to translanguaging, spatial language and understanding, and reframing teacher education. I end this final chapter by addressing implications for policy and practice, discussing how educators can use play as a tool for teaching and learning.

Multilingual Communities

In urban, new-immigrant communities, children are exposed to a variety of signs and symbols of globalization (Orellana, 2016). As they walk around their neighborhoods, they see advertisements, announcements, and street signs, in different sizes and colors, many in different or multiple languages. For instance, on a block near the school where I conducted this study, there are a number of storefronts with murals and signs in different languages. The 99-cent store mural displays two women with shopping carts filled with different items that are sold inside. The brightly colored mural, along with the sign above the entrance, contains the words "99 cents and up." Above the door, written in capital letters is a sign thanking customers for their purchases: "AGRADECMOS POR SU COMPRA." The storefront next door has two banners

with Korean writing, along with the address written in English. On the same street there are often carts advertising "tamales" or other kinds of food or sweets. Here children participate in conversations and witness interactions between many people in this "superdiverse" context.[3]

Borders

As Anzaldúa (1987) explains, both geographic and intellectual borders can cause a great deal of pain. Borders can be ideological and used to dictate norms about what should be kept together and what should be separated, which can prevent people from connecting with others (Orellana, 2016). Children, like adults, also experience borders that come between people, ideas, and cultural practices. In schools, borders often separate languages, disciplines, and ages. Accountability mandates and deficit assumptions have often resulted in narrowed curricula that constrain children's movement and assessment (Adair, 2014). Yet, in their lived experiences, children continue to cross these borders as they integrate their resources, just as they did when collecting and documenting acorns. These children worked across the borders of disciplines and languages, using literacy and numeracy practices in relation to each other, in different and multiple languages as they worked collectively in their play. It is also worth noting that these children did all this in school, a place where children are brought together and often interact across societal borders – something many adults may not have reason to do.

Translingualism & Translanguaging

Given the current context of migration and superdiversity, the movement across borders has led many scholars to employ the prefix "trans-" to suggest a transformation of something

[3] While discussions of "superdiversity" often highlight movement, they do not always stress the inequities of movement among people (Flores & Lewis, 2016) or that not everyone interacts with one another in their everyday lives. Market-driven policies and ideologies lead people to particular regions and networks, which means they may not have a reason for interacting and crossing cultural and linguistic borders in day-to-day interactions (Orellana & Rodríguez-Minkoff, 2016).

new (i.e., “translingualism,” “translanguaging,” “transmodal”). Canagarajah (2012) differentiates between “translingual” and “multilingual,” as *translingual* emphasizes a more dynamic relationship of language that moves away from the categories of native and non-native speakers to practices and products. In *multilingual* environments, it is common practice for people to access their translingual repertoires to engage in various forms of what García (2009) calls “translanguaging.” García (2009) describes this practice as “accessing different linguistic features or modes of what are described as autonomous languages in order to maximize communicative potential” (p. 140). This emphasizes the perspective of the speaker, wherein languages are viewed as practices that people use rather than independent, fixed systems (García & Kleifgen, 2010). Translanguaging highlights the practices which children engage in to make sense of and make meaning in their multilingual worlds (Gort, 2012). These practices include adjusting their language use for different speakers, “codeswitching” (alternating between languages), direct translation, re-voicing across languages as a way of repeating and clarifying, organizing and representing mathematical knowledge and understanding, thinking in one language and reading/writing/speaking in another, facilitating planning and drafting, and more (Domínguez, 2011; García, 2009; Martínez, 2010; Martínez, Orellana, Pacheco, & Carbone, 2008; Moschkovich, 1999, 2002, Orellana, 2009; Velasco & García, 2014). Children can thus draw on their full – and evolving – repertoires to make meaning, sometimes without overtly displaying the use of more than one language (García, 2013). These practices are natural and common behavior for both children and adults living in multilingual communities (García, 2009; Reyes, 2001; Zentella, 1997).

In contrast with the way speakers draw on their multiple linguistic resources, bilingual and dual-language programs in schools generally strive to foster bilingualism by separating

languages, teaching them in isolation from one another, and enforcing that separation (Pontier & Gort, 2016). Proponents of this structure argue that it protects the minority language, preventing the natural tendency for speakers to shift toward the dominant language (Cummins & Swain, 1986). This approaches bilingualism from a monolingual norm (García, 2009; Grosjean, 1989), or as "double monolingualism" (Gort & Sembiante, 2015; Heller, 2006) wherein "languages have their own unique systems and should be kept free of mixing with other languages for meaningful communication" (Canagarajah, 2012, p. 1). This perspective does not acknowledge – and may actively undermine – the ways children like Rosa, Rambo Bebé, Natasha Bebé, Anthony100, Ben10, and Emita draw on their translingual repertoires in their everyday lives to create meaning and communicate with others. As Vogel & Garcia (2017) argue, "students are always translanguaging" (p. 12). And while schooling tends to limit (or compartmentalize) the deployment of children's full repertoires of expression (separating languages, as well as disciplines) in both instruction and assessment, teachers *can* use or permit the translanguaging practices that students are already engaging in, both internally and amongst their peers (including code-switching).

Children who speak in ways that do not align with the traditional language practices of school are often stigmatized and placed on remedial educational tracks. García (2009) explains this is so regardless of "whether the child comes to school as a monolingual student speaking in ways that are different from those of school, or whether the child engages in bilingual practices that differ from the monolingual practices that schools most often impose" (p. 140). A common misconception is that translanguaging is used because children are deficient or confused about their languages (García, 2013; Martínez, 2010). Orellana (2016) explains that linguistic border crossing is often viewed as problematic in adult-defined worlds, with adults acting as a

"bilingual border patrol" (Zentella, 1997); many adults because also see border crossing between symbol systems as problematic. These adult perspectives are privileged in teaching and learning. Because of the traditional structure of classrooms and assessments, children who *do* cross those borders in the classroom are often seen to be missing the point or making errors. The adult perspective is presumed to be the "right answer," and researchers and educators end up focusing on what children do not know rather than looking to them for their own understandings and realities of their lived multilingual worlds.

Some argue that the terms "translanguaging" and "translingual" have not been fully theorized (Matsuda, 2013), sometimes being used in an all-encompassing way and at other times used simply instead of code-switching. Others distinguish between linguistic repertoires and grammars (MacSwan, 2017), and believe these ideas need to be further studied to better conceptualize how these phenomena develop with children. Still, there is an extensive and growing body of research that suggests translanguaging can be leveraged as a resource to support student learning (Canagarajah, 1995; Cook, 2001; Creese & Blackledge, 2010; Durán & Henderson, 2018; D'Warte, 2016; García, 2009; García & Wei, 2014; Gort, 2006; Heller & Martin-Jones, 2001; Makalela, 2013; Martin-Beltrán, Guzman, & Chen, 2017; Martinez, et al., forthcoming; Reyes, 2001 Vogel & García, 2017, Zapata & Tropp Laman, 2016). Each language serves as a resource for another (Gort, 2012) and learning is maximized when children can draw from their full language repertoire instead of being constrained by monolingual norms (Hornberger, 2005). Similarly, multimodal, or transmodal, forms of communication encourage children to draw from a range of communicative repertoires through using multiple modes – visual, audio, physical and spatial, written and linguistic, in different forms and styles – to convey meaning for different purposes and audiences (New London Group, 1996).

Translanguaging, thus, enables children to facilitate communication with others, and construct deeper understandings of all the different signs and modes that they encounter (García, 2009). What would it mean for schools to cultivate children's understandings and use of multiple modes of representation that surround them (García, 2009)?

Personal and Pedagogical Reflections on Language and Children

My interest in language began before I could even identify it as such. I grew up in a multilingual neighborhood where many families and children spoke more than one language. I had close friends who spoke Spanish, Japanese, Vietnamese, Cantonese, Polish, and Tagalog, and I observed their language practices with friends and family members. I also had family members of my own who spoke Spanish. At a young age, I was very aware of the limitations of my mostly monolingual repertoire.

My grandfather's first language was Ladino (Judeo-Espanyol / ג'ודיאו-איספאנייול), commonly referred to as "Judaeo-Spanish." His family came to the United States from the Island of Rhodes, originally from Spain. Though he spoke with family members in Ladino and sometimes used Spanish professionally, he did not pass the language on to my father or his five other children. My mother, who grew up in a monolingual household, studied Spanish in school and then lived and worked in Mexico City for several years. My mom hardly ever spoke to me in Spanish when I was young, but regularly used Spanish with friends and families in our neighborhood, which I overheard. We also visited family friends in Mexico periodically, some of whom spoke English in addition to Spanish. I remember always wanting to speak Spanish "fluently," and wanting to be "bilingual," both as a way to connect in the moment, and as a way to claim my family, friend, and cultural ties. When I think about it now, I do recognize that I had been using more language at the time than I realized, as I often accessed some of my Spanish

repertoire to understand and respond in English (García, 2013) and even, to a lesser extent, in some of the other languages found in my neighborhood.

When I was young, my mom worked off and on as an interpreter for my school district, and then later at a Head Start preschool. I knew my grandpa used Spanish occasionally in his medical practice. I also saw my classmates communicate in dynamic ways that I was not able to. While seeing many of the benefits of bilingualism, I also noticed a disconnect between when and for whom language was seen as an asset rather than a deficiency. My grandfather and mother were both seen as "native" speakers of English, and their Spanish was viewed as a tool for being able to translate for others. I don't ever remember my classmates' languages being acknowledged in the classroom, at least not as a resource, even though I recall many instances when they translated for others both in and outside of the classroom. I also remember these same students being pulled out of reading and writing time for ESL instruction, even when their English competencies were as strong as mine. This never made sense to me. I remember wondering why students were only pulled out of literacy blocks, and never mathematics. The discourse that "math is the universal language" seemed to stand in contrast to what we were being taught about math, and certainly what I learned about math later in life when I became an elementary school teacher. While I didn't have the same understanding of these occurrences as I do now, or the vocabulary to express my feelings, I know that I was aware of and making sense of all of this happening around me, as we know all children do in their multilingual environments (García, 2009; Gort, 2012; Orellana, 2016).

In high school I had the opportunity to study Spanish formally and began speaking more and more, but I struggled with the language through college (Spanish was one of my degrees), and was (and remain) self-conscious about speaking. Me da pena. I have always held an

expectation that I should be able to speak "better" than I do. For various reasons, I never felt this way when communicating with young children. I was always fascinated by young children, and particularly their language, so I took up many opportunities to work with children in my community. After graduating college, I taught English in elementary schools in Mexico and Argentina before beginning my teacher education program in New York. There I began to learn more formally about language and make sense of my own observations and experiences with language and children in multilingual contexts. Though my program did not have a course dedicated to language specifically, my literacy professor highlighted ways in which teachers can use children and families' home languages to support their learning. After graduating, I taught in bilingual schools in Seattle and Mexico City, both of which separated English and Spanish by "time, space, or teacher" (Pontier & Gort, 2016). Literacy was taught in both languages in both schools, but mathematics was only taught in the dominant language. Using the non-target language was strictly prohibited, despite the fact that one language can be a resource for another (Gort, 2012). Still, I observed children skillfully switching back and forth, drawing from their linguistic toolkits, and I wondered how I, and other teachers, could learn from them and better support their learning.

For the past four years I have been working with children at a play-based after-school program where I conducted a case study examining how young children understand and make meaning in play-based activities in their multilingual context. My observations and informal interviews have offered insights into how children navigate their tools of language in order to access and use literacy and mathematical knowledge. During this same time frame, along with my advisor and our research team, I have looked at children's everyday interactions around language, literacy, and culture. Drawing from what we've learned from the children, we have

provided teacher education students opportunities to work with children "in ways that tightly linked theory and practice, and that offered new ways of seeing children, teaching, and learning" (Orellana, Johnson, Rodríguez-Minkoff, Rodríguez & Franco, 2016). These experiences have led me to this current study.

Teacher Preparation in Multilingual Contexts

> Teacher education, in turn, helps to instill multicultural perspectives, values, and practices; it encourages pre-service teachers to develop a multicultural knowledge base; it cultivates a commitment to social justice; and it encourages teachers to question the purposes of education and who education serves and to enact an alternative vision in their classrooms and schools.
>
> – *Carl Grant and Melissa Gibson,* "Diversity and Teacher Education"

> Prospective teachers need to know from the start that they are a part of a larger struggle and that they have a responsibility to reform, not just replicate, standard school practices.
>
> – *Marilyn Cochran-Smith,* "Learning to Teach Against the Grain"

The field of teacher education holds great importance for students and society at large; but, there continues to be much debate about how to best educate our educators – especially when preparing them to work with students from underrepresented backgrounds, who often living in multilingual communities and face large societal inequities (Darling-Hammond & Bransford, 2007; Ladson-Billings, 2000; Nieto, 2000; Sleeter, 2008) that transcend the classroom. We know how crucial it is to support teachers in learning how to teach in a way that moves them much closer to practice (Ball & Forzani, 2009; Grossman & MacDonald, 2008; Gutiérrez, Morales, & Martínez, 2009; Grossman, Hammerness, & McDonald, 2009; Lampert, Franke, Kazemi, Ghousseini, Turrou, Beasley, Cunard, & Crowe, 2013; McDonald, Kazemi, & Kavanaugh, 2013; Zeichner, 2010), as well the importance of addressing prevailing deficit language ideologies of children growing up in multilingual contexts (Adair, Colegrove, &

McManus 2017; Miller & Sperry, 2012). As Nieto (2008) explains, "questions of language are *pedagogical* as well as *ideological*" (p. 470). Nieto calls for teacher education programs to support teachers in developing positive attitudes toward these students and their language practices. It is imperative for teacher educators to address pedagogical practices and deficit thinking together in order to create more equitable learning experiences for children (Adair, et al., 2017). In order to do so, we must first gain a better understanding of children's literacy and numeracy competencies. This is especially true for early numeracy, which is less understood from a translingual lens than early literacy practices. Understanding how children use their literacy, mathematical, and language practices in relation to each other is crucial in order to avoid replicating and recreating pedagogical practices that fail to acknowledge and leverage the practices of children living in multilingual contexts. The more we understand about children's full range of meaning-making abilities and what forms their representations take, the more we can use those tools to help teacher education students learn from and through practice.

My study explores the experiences of young children growing up in multilingual, immigrant communities who are making sense of and navigating the linguistic and numeric borders around them. Most education research neglects children's views of their own experiences (Orellana & Peer, 2013; Park, 2013), relying instead on adult perspectives (Speier, 1976). This study is, in part, a response to this dominant ideological point of view, as well as to a call to move toward more expansive definitions of literacy and mathematics that better account for their multilingual practices. The ultimate goal of this study is to contribute to a better understanding of children's full range of meaning-making abilities as they engage in literacy and numeracy practices to represent their multilingual worlds in order to support student learning by

informing teacher education. In the following chapter, I discuss the theoretical frameworks and literature I draw from.

CHAPTER 2: RELEVANT THEORETICAL FRAMEWORKS AND LITERATURE

A person's a person no matter how small.
– *Dr. Seuss,* Horton Hears a Who

Theoretical Framing

Children are often framed as "adults-in-the-making" rather than as people with their own identities and views. However, we know that young children bring prior knowledge and experiences from their everyday lives into the classroom (Carpenter & Lehrer 1999; Carpenter, Fennema, & Franke, 1996; Carraher, 1991; Franke, 1996; Hiebert & Carpenter 1992; Moschkovich, 2013; Orellana, 2009; Rosa & Orey, 2001; Siegel, 2006). The "new childhoods" perspective views children as full social agents, and aims to understand children's perspectives and social worlds (James, Jenks, & Prout, 1998). I approach this study with an understanding that children are capable learners and teachers, and that they hold their own unique perspectives of meaning-making (Kress, 2003) from which we can all learn.

My understanding of how young children are making sense of the world around them draws from sociocultural theory. This framework helps me think about how children interact with a world that is continuously influencing their language, culture, and development (Razfar & Gutiérrez, 2003), and the ways in which they construct their own understanding of what they are learning (Falchi, Axelrod, & Genishi, 2013). I approach literacy from a sociocultural perspective, looking at literacy as a repertoire of evolving practices used to communicate purposefully in social and cultural contexts (Gutiérrez & Rogoff, 2003). The theory of *ethnomathematics* (D'Ambrosio, 1985) complements this framework by approaching mathematics as "a process and as a human activity, rather than just as a set of academic content" (Rosa & Orey, 2001, p.

46). This theory helps me view numeracy, like literacy, as a set of evolving practices applied in everyday life (Palmas, 2016), expanding the notion beyond the narrow perspective of numeracy being centered exclusively on numbers and calculations (Ghose, 2007). Ethnomathematics considers the different modes in which cultures negotiate their mathematical practices (D'Ambrosio, 1993), and acknowledges that the practical mathematics used by social groups encompasses language, codes of behavior, and symbols (Rosa & Orey, 2001).

My study also builds on the New London Group's (1996) theory of *multiliteracies*, which suggests there are linguistic, visual, audio, gestural, and spatial modes of representation that can be integrated to make multimodal meaning. This expands the traditional definition of literacy from the linguistic emphasis of reading and writing words to include other modes, such as images and page layouts (visual), music and sound effects (audio), body language (gestural), environmental space and architectural spaces (spatial), and the dynamic interplay of various modes (New London Group, 1996). The integration of these different modes into a larger notion of multiple literacies "reflects the diverse ways we make meaning, in cooperation with others, often coordinating multifunctional tools, across networks and global sites" (Wohlwend, 2011, p. 3). Extensions of this work have raised questions about what counts as multimodal representation by exploring the connection between literacy and play (Wohlwend, 2008, 2011). Wohlwend (2011) suggests that the shift in redefining literacy presents an opportunity to conceptualize play as a new literacy itself by recognizing "play as a literacy for creating and coordinating a live-action text among multiple players that invests materials with pretended meanings and slips the constraints of here-and-now realities" (p. 3).

Both multiliteracies and ethnomathematics stress the different forms of socially-situated representation utilized in the meaning-making process, and "the multimodal quality of play

offers children multiple ways to expand the meaning of the messages" (Wohlwend, 2008, p. 128). We know that when participating in literacy activities, children use visuals, gestures, spatial reasoning, and talk (Dyson, 1997, 2003; Falchi et al., 2014; Kress & Jewitt, 2003; Siegel, 2006). In mathematics, children approach counting, reasoning about numbers, and problem-solving with an informal and intuitive knowledge base that is often drawn from their homes and communities (Baroody, 2004; Franke, 2003; Carpenter, Fennema, & Franke, 1996; Carpenter & Lehrer 1999; Carraher, 1991; Hiebert & Carpenter 1992). Recognizing that the transmodal qualities of play affords children multiple ways to expand on meaning (Wohlwend, 2008), I center my attention on the complex literacy and numeracy skills the children use in their play to represent the world around them.

Acknowledging Children's Resources

This study builds on an extensive body of research that frames everyday cultural knowledge and practices as resources for teaching and learning (D'Ambrosio, 1993; Franke, 2003; Gort, 2006; Lee, 1995; Martínez, 2010; Moje, 2008; Moll, Amanti, Neff, & Gonzalez, 1992; Orellana & Reynolds, 2008; Rosa & Orey, 2001; Valdés, 2001). This includes ways of using language in homes and other everyday spaces in the community (Civil, 2002; Heath, 1983; Lee 1995), understandings of how people both combine and separate language forms in multilingual communities (Martínez, 2009; Zentella, 1997), and ways of bridging language systems for others, in practices of translation/interpretation or language brokering (Orellana, 2009). These practices require reading cues in the social world to determine who *needs* translation, as well as which language forms to use with which people (Orellana & Rodríguez-Minkoff, 2016). The heightened sensitivity to audience is a competency that is cultivated in multilingual communities, but often overlooked in school.

Other studies document everyday mathematical practices, as well as the disconnect between mathematical practices in and outside of school (e.g., Abreau, 1995; Bishop & Abreu, 1991; Carraher, Carraher, & Schliemann, 1985; Civil, 2002; Gonzalez, Andrade, Civil, & Moll, 2001; Lave, 1988; Nasir, 2000; Nasir, Hand, & Taylor, 2008; Saxe, 1991), and have illustrated informal ways in which both children and adults participate mathematically in manners that are relevant to their lives and everyday experiences (Cameron, Hersch & Fosnot, 2005; Civil, 1994; Nasir, 2002; Steen, 2004). Nunes and colleagues (1988) examined "informal mathematics" practiced by children in Brazil who had little formal mathematics instruction. They found that children develop many concepts, such as proportionality and scale, through everyday experience without explicit instruction from school. For example, scale drawings can be solved by someone with carpentry knowledge and experience, without having been taught those skills in school. Additionally, they found that mathematical problems rooted in relevant contexts are easier to solve than are isolated classroom problems, and suggest "mathematics learned in everyday life may result in a better performance in problem-solving than school learning" (p. 74).

Similar to research focused on the domains of language and literacy, many studies have asked how educators can leverage mathematical practices used outside of school (Nunes, 1992). Moschkovich (2013) explains that students' everyday language and home languages are linguistic resources for communicating mathematical reasoning. We also know that fully engaging in mathematical discourse requires an opportunity for students to use "all the linguistic competencies that are available to them" (Rubinstein-Ávila, Sox, Kaplan, & McGraw, 2015), and that children use translanguaging to support mathematical claims, clarify mathematical meanings, and make connections to mathematical representations (Moschkovich, 2007). Educators can not only learn from what children know, but also create opportunities for their out-

of-school knowledge and experiences to connect with their in-school knowledge and experiences; the intersection can include both their linguistic and numeric repertoires. This study builds on these questions, asking how we can identify children's literacy and numeracy understandings in play, and leverage their translingual resources into meaningful learning practices.

Playful Learning

A sociocultural theory of learning and development emphasizes the notion that people learn through participation in cultural practices (Gutiérrez & Rogoff 2003; Lave & Wenger 1998; Rogoff, 1994; Vygotsky, 1978). These processes occur over time through engagement in activities, interaction with others, and using the tools of culture (Orellana, 2016). This is quite different than viewing learning as the acquisition of fixed knowledge and the idea that learning can be standardized with specific skills expected to be learned at specific times in specific ways (Dyson, 1999; Fennimore & Goodwin, 2011). Under this approach, learning is "compartmentalized into domain-specific lessons (mathematics, reading, language) to ensure the appropriate knowledge is being conveyed" (Fisher et al., 2010, p. 2) with little value placed on playful learning.

Fisher and colleagues (2010) define playful learning as both "free play" and "guided play," and a "whole child educational approach that promotes academic, socio-emotional, and cognitive development" (p. 3). Researchers have described playful learning as pleasurable, enjoyable, spontaneous, engrossing, non-literal, and engaging, saying it can contain elements of make-believe without extrinsic goals (Hirsh-Pasek & Golinkoff, 2008). According to Vygotsky (1978), "a child's greatest achievements are possible through play" (p. 96). Research suggests that children's play fosters mathematics, language, early literacy, socioemotional skills, problem-

solving skills, and more (Campbell, Pungello, Miller-Johnson, Burchinal, & Ramey, 2001; Campbell & Ramey, 1995; Gardner, 1995; Hirsh-Pasek, Golinkoff, Berk, & Singer, 2009; Reynolds, Ou, & Topitzes, 2004; Schweinhart, 2004; Weikart, 1998; Wohlwend, 2011; Wohlwend & Peppler, 2015; Yogman, Garner, Hutchinson, Hirsh-Pasek, Golinkoff & Committee on Psychosocial Aspects of Child and Family Health, 2018; Zigler, & Bishop-Josef, 2004), which does not stand in contrast to "academic learning." In the following sections I discuss some of the research on children's literacy, mathematical, and language practices in play.

Learning Literacy Through Play

Early research on play and literacy was largely grounded in theories of Piaget (1970) and Vygotsky (1978), who emphasized the connection between play and literacy learning. Pellegrini and Galda (1982) observe that both theorists viewed symbolic play as an important opportunity for children to "practice" (Piaget) and "learn" (Vygotsky) using representation. Through play, children experiment with critical thinking skills that are foundational for early literacy competencies (Lockhard, 2010; Roskos & Christie 2000) and emergent literacy skills, such as "awareness of letters and print, and the purpose of books" (Smith & Pellegrini, 2013, p. 3). In their play, children take on the role of writers (Dyson 1997, 1999; Trawick-Smith 2001), have opportunities to practice book-related behaviors (Rowe, 2000), and develop the ability to verbalize and comprehend text (Roskos, 1988).

Many researchers and educators have outlined the importance of literacy tools, such as pencils and paper, for making meaning in play (Dyson & Genishi, 2005). Examples might include creating grocery lists or taking orders in a restaurant, jotting notes from telephone calls, or map-making for superheroes who are saving the world (Marsh, 1999; Roskos & Christie, 2001). Hirsh-Pasek and Golinkoff (2008) observe that young children's emergent literacy skills

are fostered by engaging in playful learning activities such as "rhyming games, making shopping lists, and 'reading' story books to stuffed animals" (p. 2).

In a literature review on studies addressing play and literacy learning, Roskos and Christie (2001) found that play supports literacy by "providing settings that promote literacy activity, skills, and strategies; serving as a language experience that can build connections between oral and written modes of expression; and, providing opportunities to teach and learn literacy" (p. 59). For example, Wohlwend (2011) details how children skillfully produced drawings and artifacts as they created sports logos, football drawings, and SpongeBob puppets, as well as other art projects. During their design processes, the children incorporated different modes and materials to make meaning as they took on identities as designers in this pretend space.

Learning Mathematics through Play

Other studies have documented how children engage with mathematics through play (Ginsburg, 2006; Perry & Dockett, 2004; Tudge & Doucet, 2004; Wager, 2013), and how teachers can support children's mathematical learning by attending to their mathematical ideas in play (Perry & Dockett 2008a, 2008b; Perry, Dockett, & Harley, 2012; Wager & Parks, 2014). Playful learning spaces provide children opportunities to explore and develop mathematical concepts, and engage with new ideas introduced in the classroom (Parks & Chang 2012). In a study of 4- and 5-year-old children, Seo and Ginsburg (2004) found that through free-play children develop understandings of patterns and spatial forms, and numerical judgment. Other studies have demonstrated how games can support children's early numeracy understandings, including counting, making comparisons, and number line estimation tasks (Ramani & Siegler, 2008; Siegler & Ramani, 2008; Wang & Hung, 2010). For instance, Siegler

(2009) found that playing linear board games (such as Chutes and Ladders) supports a number of young children's mathematical practices, including counting, identifying numbers, understanding the sequencing of numbers (i.e., placing the numbers 1 through 10 in the correct order), the magnitude of numbers (i.e., the sense of quantity and how much each number represents), the number line (placing numbers on a number line and understanding that certain numbers are closer to other numbers; i.e. 4 is closer to 5 than it is to 0), and solving arithmetic problems.

Just as literacy tools and materials are helpful in supporting children in literacy learning in play, research demonstrates that availability and arrangement of classroom resources and materials (such as collections of items to count) encourages initiative and engagement (Copple & Bredekamp, 2009) and has a positive impact on children's early mathematics. Providing children opportunities in play to engage in counting items supports children's development of number sense (Schwerdtfeger & Chan, 2007). These opportunities can come from mathematics manipulatives, such as Counting Bears, as well as other teacher- or child-selected items in the classroom or from home. Research also suggests that engaging with materials such as puzzles and blocks supports children's spatial development (Clements, 2004; National Research Council, 2009; Van Oers, 2010). Additionally, children's mathematical practices are better supported when they have a range of materials to encourage different areas of interest within play (Bennett & Weidner, 2012), and teachers to attend to and respond to children's mathematical learning in play (Wager & Parks, 2016). Research has highlighted how teachers can support mathematical learning through play by using mathematical language to describe children's play (Thomás, Warren & deVries, 2011), scaffolding conversations and instruction (Siraj-Blatchford & Sylva, 2004, p. 723), and asking clarification questions (Macmillan, 2002).

Play in Multilingual Contexts

While much of the research on children's literacy and numeracy practices in play has focused on children's practices in monolingual or English-dominated contexts (i.e., Motteweiler & Taylor, 2014; Wager & Parks, 2014; Wohlwend, 2008; 2011), ongoing research has highlighted how children use translanguaging practices to accomplish a variety of play goals (Bengochea, Sembiante, & Gort, 2018). Children living in multilingual contexts use their linguistic resources to "elaborate on the meaning of objects and play events, and to fluidly draw from their linguistic repertoire in order to solve problems, extend storylines, designate roles, plan and initiate play events, co-construct social roles and internalize social identities" (Bengochea et al., 2018, p. 41). Children strategically select features from their translingual repertoires in order to direct the flow and organization of play (Orellana, 1994), introduce rhetorical and dramatic elements within their play (Cromdal & Aronsson, 2000), instruct younger peers (Yun, 2008), and include peers in their play activity (Franco, Orellana, & Franke, 2019). Play provides opportunities for children to use translanguaging practices in both teacher- and student-directed activities (Bengochea et al., 2018).

Play in Early Childhood Classrooms

It is suggested that play in early childhood education provides the most developmentally-appropriate approach to supporting students' growth in multiple disciplines and domains (Bodrova 2008; Copple & Bredekamp, 2009); however, accountability mandates linked to state education standards and assessments, such as standardized testing and scripted curricula, have replaced play in pre-kindergarten and early elementary classrooms (Miller & Almon, 2009; Pellegrini, 2009; Wohlwend, 2011). For example, children in full-day kindergarten classrooms in Los Angeles often spend three to four hours on teacher-directed literacy, math instruction, and

test preparation, with only 30 minutes or less on play activities (Miller & Almon, 2009). This approach prevents educators from using play as a method for children to engage in activities that enable them to acquire information and practice skills to expand their repertoire of meaning-making abilities (Elkind, 2007).

It is documented that many well-intentioned early childhood educators have had to limit playful learning experiences, including exploratory activities, student-initiated projects and experiments, collaborative work, and discussions, in order to prepare for high-stakes standardized testing (Genishi & Dyson, 2012; Hirsh-Pasek, et al., 2009). This type of assessment pressure has narrowed curricular focuses and made it difficult for teachers to support children in expanding their capabilities past a narrow set of math and literacy skills (Adair, 2014). It has also limited teachers from encouraging, extending, and drawing from children's interests and curiosity (Klahr, Zimmerman, & Jirout, 2011). In addition to relying on constricted definitions of learning and achievement, our mainstream pedagogy remains firmly planted in a monolingual version of America (Flores & Lewis, 2016; Gumperz & Cook-Gumperz, 2005), often restricting children from drawing from their full linguistic repertoires (Gutierrez & Rogoff, 2003) to develop literacy (Canagarajah 1995; Falchi et al., 2013; García, 2009) and mathematical competencies (Moschkovich, 1999, 2002). If instead, we view play as a learning process and as a way to see what children understand and can do when they're able to draw from their full linguistic and numeric resources, we can obtain a more holistic and accurate perspective on what children must develop to be successful in school and the modern world (Bell-Rose & Desai, 2006; Fisher et al., 2010; Hirsh-Pasek et al., 2008; Wohlwend, 2011; Wohlwend & Peppler, 2015).

Understanding how children learn allows us to think about the ways in which they make sense of their world and how they use their tools of representation, which I discuss in the following sections.

Children's Representations

In their play, children make complex representations of the world: both the one they see around them and the ones they imagine. According to Vygotsky (1978), play facilitates children's symbolic reasoning, enabling them to manipulate objects and learn about sign-symbol relationships and possibilities. Like other forms of literacies, children's play produces signs, objects, and actions that represent ideas (Kress, 1997; Siegel, 2006; Wohlwend, 2008). Play enables children to participate in complex literacy and mathematical practices, allowing them to play the expert.

Kress and Jewitt (2003) explain that modes of representation are "the effect of the work of culture in shaping material into resources for representation" (p. 1). Kress (2003) recognizes that children have an inherent interest in meaning-making. He explains that although the principles of meaning-making are the same for adults and children, there is a difference in perspective in the way children and adults think about the meaning-making process, largely due to the fact that adults have had more time to be socialized and trained to see the world in a particular way. Kenner (2004) adds that "the wider society tries to keep children's worlds separate, with different codes for each context. Children, however, tend to integrate and synthesize their resources" (p. 59). Adults tend to be more constrained by traditional and conventional modes of representation, whereas children are more often able to shift easily between modes to express their messages through creative exploration of materials they produce

(Kress, 2003). Play provides opportunities for children to utilize these modes to make meaning (Wohlwend, 2008).

Although there is a great deal of literature in the literacy field dealing with the subject of representation, and a great deal in the field of mathematics, there is very little that addresses the commonalities between both. In fact, we know that young children's home, school, and community interactions influence the way they conceptualize both literacy and numeracy practices. Orellana (2016) writes that in everyday interactions language and literacy are used because of the natural human desire for social interaction and the need to *do things* in the social world. Schools, she elaborates, "often teach about language and literacy, rather than using language and literacy to do things, and learning how to use the tools by using them" (p. 46). Regardless, children see a relationship between symbolic representations and ideas (Vygotsky, 1978). They learn that words, pictures, objects, and movement can represent ideas. Falchi, Axelrod, and Genishi (2013) offer the example of a young child who utilizes visuals and spatial ordering in his four-quadrant story to convey a detailed story during his classroom literacy block. The authors explain that this meaning-making was not valued by the literacy curriculum, which privileged traditional forms of written literacy.

As with literacy, children use multiple modes of representation when communicating mathematically. These representations not only help educators understand children's thinking, but also encourage children to reflect on their own thinking processes, as well as those of their peers. Franke (2003) stresses the importance of educators doing more than just listening to children's explanations of their strategies in order to foster communication. Referring to children's' counting, she explains that their representations provide insight into "not only how many items [were] counted, but also the students' abilities to organize, label, group, and

represent their collections in multiple forms" (p. 107). Moschkovich (2013) adds that language in mathematics classrooms is complex and encompasses many forms of representations, such as objects, pictures, words, symbols, tables, and graphs, and is expressed through different modes (e.g., oral, written, receptive, expressive). Using representations to communicate about mathematics is crucial to mathematical learning (Campbell, Adams, & Davis, 2007; Sfard, 2008).

Principles of representation can also be applied to other languages (Kress, 2012). For example, once children have an understanding that a symbol represents a word, sound, or quantity, they can transfer this idea to another language. This might seem intuitive, but this process is in fact complex; languages are not isolated from one another, and navigating languages entails multiliteracies. Domínguez (2011) emphasizes the role of language in mathematics. He reveals that using multiple languages influences the way children organize and represent their mathematical knowledge. Children also draw on their ability to communicate in multiple languages to accomplish arithmetic computation (Moschkovich, 2007). Rosa and Orey (2001) problematize separation between math and language in schools, explaining that teaching and curricula do not attend to children's prior mathematical understandings and resources, including the language they use in participating in mathematical representations.

CHAPTER 3: METHODOLOGY & RESEARCH DESIGN

> Imagine what our theories might be like if instead, development was traced in terms of structures lost over the course of childhood, and what adults therefore lack relative to children.
>
> – Cindy Dell Clark, *In A Younger Voice: Doing Child-Centered Qualitative Research*

In this study, I employed ethnographic case study methods to capture children's understandings of the world around them and how they use their full range of meaning-making abilities in relation to their multilingual contexts (Dyson & Genishi, 2005). My approach was informed by child-centered modes of inquiry, acknowledging that children's voices should be integral to research and understandings about children (Bucknall, 2012; Christiansen & James, 2008; Corsaro, 1997, 2005; Corsaro & Miller, 1992; Dell Clark, 2011; James & Prout, 1997). This approach emphasizes the importance of research not being conducted on children but with them and for them (Hood, Kelley, & Mayall, 1996). In order to highlight their voices, I use the term "collaborators" rather than "participants" for the children in my study. I use this term to acknowledge our collaborative relationship within the research project as well as the children's play.[4] In line with the new childhoods perspective I outlined in Chapter 2, I recognize children as active agents who interpret their own lived realities (James, Jenks, & Prout, 1998). By thinking of the children as collaborators, researchers can shift the authority and power toward the children in both observation and interpretation (Dell Clark, 2001) and counter the prevalent adult-centered ideological viewpoint (Speier, 1976).

[4] While I brought my own research focus and interests, I aimed to build a collaborative relationship with the children wherein they felt comfortable sharing their own perspectives and resisting or pushing back on mine. At times the children would bring drawings or other creations to show me so I could learn more for my project. The children often turned down suggestions I made during activities. Similarly, I felt that I was often viewed as a collaborator in the children's play.

In my study, I examined how children used literacy and numeracy practices as they created representations in their play in ways and for purposes that were meaningful to them. My goal was not only to better understand children's everyday literacy and numeracy practices in multilingual contexts, but also to inform teacher education so that it better supports student learning in multilingual, immigrant communities. In the following sections I describe the setting for my study, my role as a researcher, the children involved in the study, recruitment methods, data collection and analysis, and methodological questions and limitations.

Research Setting & Collaborators

B-Club

The study was conducted at an after-school program we call B-Club, which is part of a larger network of community partnerships that integrate research, teaching, and community engagement.[5] B-Club, like the other UC-Links programs,[6] is guided by sociocultural principles of learning (Vygotsky, 1978). The program is an extension of one of the school's larger after-school programs, and brings university students from diverse backgrounds together with Transitioning Kindergarten (TK)-5th grade students who are children of immigrants from Mexico, Central America, Korea, the Philippines, and Bangladesh (Orellana, 2016).

Children's natural love for play and connecting with others is at the center of learning at B-Club (Orellana, 2016). The program draws from Rogoff's (1994) Community of Learners model, which emphasizes the role of collaboration between members and the fluid shifting of expertise. At B-Club, researchers, pre-service teachers, undergraduate students, and children learn and play

[5] This model, established by Mike Cole in the 1980s, was referred to as the "Fifth Dimension" (Cole & Distributed Literacy Consortium, 2006). La Clase Mágica is a bilingual extension of this program which was developed by Olga Vásquez (Vásquez, 2003). B-Club is the direct descendent of a program run by Kris Gutiérrez for many years (Gutiérrez, Baquedano-López, Alvarez, & Chiu, 1999).

[6] See http://uclinks.berkeley.edu/ for more information about the network of university-community partnership programs.

together, with the adults facilitating activities by providing spaces in and materials with which the children can engage in creative processes, which they often do together with the adults. Through play, children experiment and navigate complex skills and competencies wherein they can "act a head taller than themselves" (Vygotsky, 1978). B-Club creates a context wherein children can play with and express their understanding of the various literary and mathematical forms they are exposed to in their everyday lives.

The activities at B-Club often change and evolve over time, both at the initiative of the children and based on materials we bring in. On a given day, children write letters on stationery or cards to deliver to other B-Club members or to take home to family. Others use cardboard, paper, tape, tables, chairs, and other materials to create all kinds of things, such as cars, houses, rocket ships, castles, and more. Some children use video cameras to film portions of a movie or documentary. Other children might be outside in "Explorer's Club" where they often write in notebooks, jotting down notes and drawings about what they see. Other children play board games or build with blocks. In all of these activities, children are engaging with their peers as well as university students.

B-Club promotes multilingual and multimodal literacies, and encourages members to cross cultural and linguistic borders playfully. We explore what happens when words, sounds, letters, genres, ideas, and people blend freely and creatively. The children at B-Club cross borders in ways that often challenge and extend our adult ideas about those linguistic and cultural borders. B-Club is a place to think about how children learn and how to support that learning.[7]

Dell Clark (2011) explains that when doing research it is important to anchor studies in

[7] See Orellana (2016) and Orellana, et al. (2019) for more information on B-Club and the larger research project.

children's local cultural meanings and that local discourses should align with investigative goals and procedures. I chose B-Club for my dissertation (and pilot work) site because by promoting translingual repertoires it creates a context that privileges the forms of communication found in the community. Additionally, the Community of Learners model is in line with my child-centered research methods for highlighting children's voices. Below I discuss the school and community context, my participation and prior work at B-Club, and introduce my collaborators in this study.

The School and Community

B-Club is located in the heart of Los Angeles. The program serves students who attend a TK-12 community school partnered with a large research university. The students who are members of B-Club are enrolled in one of the school's two dual-language programs – Spanish/English or Korean/English. The school's mission includes fostering self-directed passionate learners who are bilingual/biliterate/bicultural and active in the community. The dense urban community surrounding the school consists mostly of families from Mexico, Central America, and Korea living in low-socio-economic households (*Los Angeles Times*, 2014). This area has been a destination for new immigrants and refugees from Central America for the last 30 years, and more recently has had an increase in immigration from families from southern Mexico, including families who speak indigenous languages (Orellana & Rodríguez-Minkoff, 2016). This superdiverse neighborhood is full of rich environmental print that comes in various designs, with English, Spanish, Korean, Spanglish, and Konglish seen and heard on the streets (see Figure 3.1). It is exactly the kind of place where borders are at once blurred, and simultaneously very evident, populated by people whose lives have straddled these borders, and who deal with them in one form or another every day. Adults living in superdiverse communities

may not always have reasons to interact or cross cultural and linguistic borders, but children from different backgrounds do come together in school, as they also do at B-Club. This makes B-Club an ideal place to explore the relationship of language and superdiversity from the children's perspective.

Figure 3.1: Business Sign in B-Club Community

My Participation and Prior Work at B-Club

I have been a researcher and facilitator at B-Club for the past four years, helping with the logistics, theories, and pedagogical practices that guide the Club. During this time, I have been part of a research team that has examined children's language and literacy learning in this space, as well as how UCLA undergraduate and teacher education graduate students are seeing children and their learning. I have also been part of the instructional team that leads UCLA courses connected to B-Club. In addition to my time spent at B-Club, I have observed classrooms at the school as a field supervisor for pre-service teachers and as part of my pilot work. Because of

these experiences, I had already developed a relationship with some of the children, family members, and staff at the school before beginning my dissertation research.

My dissertation work was informed by a pilot study I designed and implemented at B-Club. Using ethnographic data collected through participant observation and informal interviews, the study examined how three kindergartners utilized literacy and numeracy practices to construct a castle using their own blueprint. The analysis offered insights as to how young children collaborate in their play to access and use translingual literacy and mathematical knowledge.

Understanding that children have their own perspectives that differ from those of adults (Kress, 2003), I spent time with the collaborators in my dissertation and pilot studies, building relationships and informing the children about my research interests. Over time, this led to the children opening up more about their own experiences, both in and outside of school, and helped me better see how they approached different activities. While still acknowledging that I was an adult (sometimes looking to me for permission), the children often seemed to view me as part of their playgroup. At times, this sentiment was shown through my data collection process. For instance, I was sometimes asked to put down a video camera or stop taking pictures so I could "help" or "play" more with the group.

Collaborator Recruitment

B-Club is an extension of a larger after-school program for students whose families need care for after-school hours. The Club is in session during the academic quarters and typically meets once or twice a week. Membership in B-Club is on a first-come, first-served basis, with priority given to past members and siblings. We also aim to have a balanced group of ages and linguistically-diverse participants; total enrollment is roughly 40 students.

I met with the after-school coordinator in the beginning of the academic year, before B-Club started, to look over the roster and develop a strategy for recruitment. There were a number of kindergartners enrolled in the program who were new to the school that year. The largest number in one classroom was five, in Ms. R's K-1 Spanish/English classroom. I was already familiar with Ms. R because I had visited her classroom the previous year for my pilot work. Classrooms at the school are composed of multiple-aged learning groups that span multiple grade levels. Entering the study, I knew I wanted to recruit children from the same Spanish-English K-1 classroom. This afforded me more extensive classroom observation time. One of the kindergartners in Ms. R's classroom had a twin sister in another K-1 classroom whom I ultimately decided to include in my case study as well. It was important to their mother for her to be included, and she spent a lot of time with the children in B-Club and the after-school program.

It was important to me to begin this research before B-Club started in order to build rapport with the children and families. So, before my formal research began, I met with the families in person during the regular after-school program hours to provide them information about enrolling in B-Club, as well as the consent forms for participating in my study. In addition to the paperwork we usually provide for B-Club, I also created a small handout (in English and Spanish) with more information on my study and myself, and spoke informally with families and the children about what I was hoping to learn by working closely with them that year. Children also signed forms to participate, and I explained to them – and their family members – that they could withdraw at any time and did not need to be part of the study to participate in B-Club. Additionally, I met with Ms. R to explain my study and focus, as well as the consent form. Below I describe her classroom.

Ms. R's Classroom

Ms. R's classroom was bright and colorful. Student work always hung on the walls, as well as different signs in Spanish and English, or both. In the front of the room there was a "muro de palabras" on which words in Spanish were listed under their corresponding letter. On the other side of the room, the Spanish alphabet was displayed above student artwork. Along that same wall was a listening station and a variety of manipulatives on shelves. Adjacent, against the windows that faced out to the playground, was the reading area, with a carpet, pillows, stuffed animals, and lots of books. The children seemed to enjoy cuddling with or reading to the stuffed animals.

Ms. R had been teaching for 30 years. She started her career teaching in a bilingual elementary program and then later taught parenting classes, ESL courses, and worked as a teacher trainer in Honduras as part of the U.S. Peace Corps. She also coordinated a Healthy Start[8] program for a couple of years. She had been at her current position at the school for six years, was the lead teacher for two, and had also served on the operations team. Ms. R is Mexican-American and grew up in Douglas, Arizona, bordering Mexico. Both of her parents were from Sonora, Mexico. It was important to her parents that she and her siblings spoke Spanish well, so in addition to attending elementary school in Douglas, she also attended night school on the other side of the border in Agua Prieta, Mexico.

In Ms. R's classroom the students often sat together on the carpet in the front of the room for read-alouds and other whole-group activities. They participated in discussions, with many opportunities to talk with partners or small groups. Other times students worked in small groups or pairs at various stations or on different activities. The K-1 (as well as TK) classrooms follow a

[8] Healthy Start aims to serve children, young, their family members and the community.

90/10 model of instruction, with 90% of the instruction in Spanish and 10% in English (English Language Development was taught through science and social studies content). While the teacher instruction and content (reading and writing workshop, etc.) followed this model, the language practices within the classroom were more fluid, and teachers were learning through professional development at the school to support translanguaging in the classroom. Ms. R also explained that she attended to the particular needs of her students when thinking about language practices.

Most days the school day ended with developmental centers where students chose from a variety of stations such as blocks/Legos, dress up, puzzles, and more. Students seemed to always look forward to this time of day. Ms. R and the other K-1 teachers had observed that these developmental centers foster collaboration, negotiation, and empathy. As a team, the six TK and K-1 teachers have spent time reading literature and thinking together about how to support playful learning in their classrooms. They saw a need for further resources and support for creating more opportunities for play in the classroom while promoting curricular goals.

During the school year, Ms. R's class went on a number of field trips. One of these was a community walk which was part of their social studies unit "Our Neighborhood and Community." They began the unit with a KWL chart, thinking about what they already *KNEW* and what they *WANTED to know*, then later revisited what they *LEARNED*. For their community walk field trip, each student walked with a partner and a chaperone, taking notes about what they saw. After the field trip, students created their own maps to represent their community (these will be referenced in Chapter 5). During this unit, there were many kinds of maps up on the walls of the classroom, and students engaged in read-alouds and activities related to the community.

Every year starting in March, Ms. R began “Lee conmigo” wherein she invited her students’ family members to come into the classroom for the first twelve minutes of the school day to read. Visitors often included parents, grandparents, and even older siblings, and they generally sat with the students at their desks. Students, together with their family members, chose which books they wanted to read. Sometimes these books were in English, other times in Spanish, and sometimes they were bilingual. Sometimes younger siblings accompanied the family members while sitting in strollers. Students who did not have family members attending read together on the carpet.

In the following section, I introduce each of the six kindergartners in my study, all of whom were five years old when the study began and turned six at different points of the school year. They chose their own pseudonyms. I also highlight a few additional children and adults who participated in the interactions on which I focus my analysis.

Introducing the Children

Rosa

Rosa chose the name “Rosa Blanca” because “Rosa” was the name of her favorite tía and she liked how both colors sounded together. She preferred to be called “Rosa” for short. Rosa most often played with Rambo Bebé and Natasha Bebé, She liked to take the lead, and often could be found directing others in their play. At B-Club, Rosa frequently did the writing as others dictated language for a sign or other shared project. Rosa loved to read. She always looked forward to Library Day and picking out new books. She especially liked books by Dr. Seuss (preferably in Spanish). Her dad sometimes read with her in Spanish during the morning family reading time. She spoke Spanish at home with her parents and little sister. One of her parents was from Guatemala and one from El Salvador. Rosa’s mom and little sister picked her up every day after school, and Rosa was always excited to share what she did that day.

Anthony100

Anthony100 brought enthusiasm to the activities he joined. His favorite activities to do at home were playing soccer and reading books. His favorite book characters were Cat in the Hat and Elmo. When I went on a walk with him, his mom, and one of his brothers after school one day, he pointed out some of his favorite places which included the library, YMCA, and an ice cream store. At B-Club, when he wasn't playing with the other kindergartners, Anthony100 often played soccer with some of the older children. He liked being outside. Anthony100's mom was from Guatemala and his dad from Mexico. Anthony100's mom shared that he has always been very adaptable and helpful. He often translated for her. Anthony100 spoke Spanish with his parents, and English with his two older brothers. He often switched from English to Spanish to Spanglish, depending on whom he was talking to. He told me that he tried to speak whatever language others knew best. When he chose his secret name, he first said "Anthony" (a name he liked) and "10"; but, he paused and said, "Quiero ser un grande número," expressing that he wanted to be a bigger number. He was also explicit that he wanted the number to be spoken in Spanish and written as a numeral (in other words, spoken as "AnthonyCien" but written and read as "Anthony100").

Emita

Emita was inquisitive, always asking questions as she played with others. She was very thoughtful and showed concern for others. Her mom told me she gets very attached to people and doesn't like change. Emita's older brother was a sixth-grader at the school, and often came to pick her up early from B-Club along with their mom. He also read with her during the family morning reading. The two of them took turns reading books in Spanish while speaking to each other in English. Emita expressed that she did not always feel comfortable speaking Spanish

because she was better at English. Her teacher told me she was beginning to read much more in Spanish. Her parents were from Honduras and El Salvador, and were speaking more Spanish with her at home. During developmental centers, Emita often chose playdough or reading books. She told me she wanted to start reading chapters books like the *Secret Life of Pets*. In addition to talking a lot about animals and wanting pets, Emita also talked about her family, and often made things at B-Club for her family members. Emita picked her pseudonym because it was a nickname her dad sometimes called her.

Ben10

Ben10 chose his secret name because he loved superheroes and the character Ben10, from a *Cartoon Network* series, was one of his favorites. In fact, he had seen the movie *Ben10* in a pretend movie theater he made at B-Club. Ben10 had a great imagination and liked to see his ideas come to life. He had an older brother and sister at B-Club whom he often played with inside the Casas & Houses, which the children built out of cardboard (explained in further detail below). He also had a younger brother who came with his mom sometimes to read with him during the morning family reading time; both his parents were from El Salvador. Ben10 loved using technology – he often asked to use cameras and video cameras to record things at B-Club, and enlisted adults to look up things on phones for him. The after-school program coordinator told me he learned English from watching YouTube. Although his mom spoke mostly Spanish, Ben10 almost always responded in English. He spoke English with his siblings and friends at school. At B-Club, Ben10 usually had a vision of what he wanted to do or make, and seemed happy to carry that out with others, or by himself. At the end of the day, he always seemed excited to bring home whatever he had made that day to show to his mom.

Rambo Bebé

Rambo Bebé chose her pseudonym, along with her twin sister's, "Natasha Bebé," in honor of two horses they visited outside of the city with their mother. The first time Rambo Bebé mentioned the horses' names, her face lit up. Rambo Bebé and Natasha Bebé also had an older brother who went to a different school. Their parents were both from Guatemala and spoke K'iche (a Mayan language) and Spanish. Their mother told me she, herself, learned Spanish when she was older, and tried to speak Spanish to her children so they could have more opportunities. She also wanted them to learn English. Rambo Bebé often asked me and other adults to read signs on the wall to her, or to write out words. This shifted over time as she started feeling more comfortable reading and writing. She was always very curious about her surroundings and listened attentively. When she encountered a challenge or problem within an activity, she almost always found a way to solve it. She was very creative and resourceful.

Natasha Bebé

Natasha Bebé, who decided on her pseudonym with her sister, was the only collaborator in my study who was not in Ms. R's classroom. She was in the K-1 classroom next door, which was also a Spanish-English classroom. Almost every day in B-Club, Natasha Bebé wrote a note or made a drawing for one of her family members. Sometimes it was for her older brother, and other times it was to say "te quiero" to her dad or "I love Mami." Natasha Bebé spoke mostly Spanish with her friends, but seemed fairly comfortable speaking English at B-Club and in the classroom when a child or adult did not speak Spanish. She was also very proud to share a few words in K'iche she knew, and told us that her mom would teach her more. When I walked around the neighborhood with Natasha Bebé, Rambo Bebé, and their mother, Natasha Bebé was excited to show me where her cousin lived and point out where they take the bus. Both Natasha

Bebé and her sister expressed that they like taking the bus because they can see more places out of the big window. They normally went somewhere different every Sunday, exploring different parts of LA: parks, the beach, different neighborhoods. This is what led them to see the horses for whom they named themselves, and whom they went back to see a couple of times.

Other B-Club Members

The following B-Club members interacted frequently with the kindergartners in my study. I provide a brief description of each individual in order to inform readers' understanding of the field notes that follow in the next chapter.

Jeffy: was a first-grader in Ms. R's classroom and often played with Anthony100 and Ben10. He shared their interest in superheroes and imaginative play.

Cammy: was a first-grader in the K-1 Korean-English classroom. She had two older sisters in B-Club and one younger sister who was in her after-school classroom, along with the collaborators in my study. Cammy often played with them in B-Club and during the after-school program.

Jasmine: was an undergraduate student who was interested in imaginary play. She frequently worked with Ben10. Jasmine chose her pseudonym because "Jasmine" was her favorite Disney princess.

Lilia: like me, was a graduate student researcher who was participating and observing at B-Club collecting data for her dissertation. Her research focused on children's play and the role of undergraduate students in their play. Lilia had been a member of B-Club for five years, working closely with children of a variety of ages.

After-School Program

The elementary school's after-school program – of which B-Club is one component – is comprised of three multiple-aged learning groups. The youngest group consists of children from TK, kindergarten, and first grade. Unlike the school day classrooms, wherein children are separated into Spanish- or Korean-track classrooms, the after-school program includes students from both tracks. Each after-school group has one main teacher and often additional volunteers (adults and/or older children). All three groups start after-school time with a snack together, then go back to their respective classrooms. Generally, the youngest group spends time playing outside on the play structure before going inside to do a few group activities and working on homework. When children finish their homework, they can choose books to read (with options in English, Spanish, and Korean) or color. At the end of the day everyone cleans up and goes outside to play on the structure until they are picked up.

Mini B-Club

I had planned to start my participant observations at B-Club's Fall Quarter, however this after-school program did not begin this particular year until the Winter Quarter. Instead, Lilia and I ran a model we had done the year before, inviting small groups from the existing after-school program to participate in one of the two groups, each of us running one. Some weeks I met with just "my" six kindergartners, and other weeks we combined with Lilia's group. The kindergartners referred to this as "Mini B-Club."

On the first day, I walked to the upper field with Rosa, Ben10, Rambo Bebé, Natasha Bebé, and Anthony100. Emita was absent. The five of them walked in a line, as they did during their regular after-school program. We sat on the cement benches near the upper field. I first reminded the children about my study/project (I used these terms interchangeably with them),

and that I wanted to learn more about how kids use language, reading, writing, math and other things through play. Next, we discussed what B-Club was and our mini-club "acuerdos," which I describe further below.

What is B-Club?

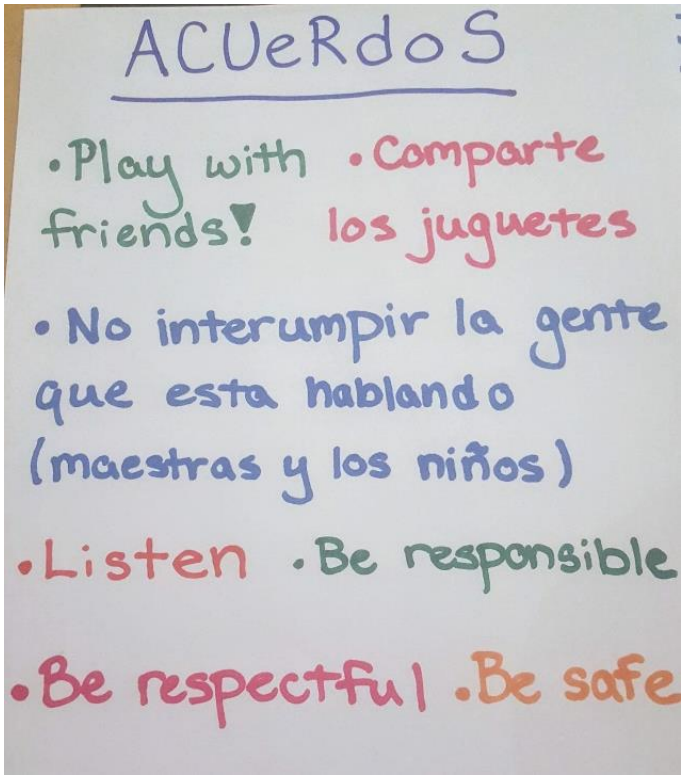
I asked if any of the children had heard of "B-Club" before. Ben10 told us that his brother and sister were in B-Club, and that they said "you get to use cameras." Anthony100 added that his friend Jeffy said they "build lots of stuff with cardboard." I then explained that normally we will have UCLA undergraduates or graduates there, referred to as "ugs" and "grugs," and gave some more examples of the kinds of activities we have done in the past, like Cardboard World, Mail Center, storytelling, arts and crafts, Explorer's Club, board games, etc.

Acuerdos

At B-Club we (children and adults) collectively generate a set of "acuerdos" or agreements that we continuously re-visit and re-create each quarter. Our acuerdos guide all of us in this playful learning space. Before showing the kindergartners the last quarter's list of acuerdos, I asked them to think about what they would want us to agree to as we play together at Mini B-Club. Natasha Bebé said, "We can play with friends." Anthony100 suggested "listen," and Rambo Bebé added, "No interrumpir las gentes que está hablando." Anthony100 included teachers: "Escucha a las maestras que está hablando." I asked about children too. Anthony100 and the others nodded in agreement. Rambo Bebé said, "Miss, I know the three 'Be's'" and listed them: "Be Responsible, be Respectful, and be Safe." Rosa then shared that sharing toys was important: "Comparte los juguetes." We then talked a little about how to write out these acuerdos and which colors to use. I wrote the list (Figure 3.2), and showed them the prior list of acuerdos. It's worth noting that in previous years, the acuerdos were all in English whereas our

Mini B-Club list included both English and Spanish. Rambo Bebé and Anthony100 seemed excited to see the three Be's.

Figure 3.2: Mini B-Club Acuerdos



Data Collection

In order to explore the experiences of young children growing up in multilingual, immigrant communities, I drew from a variety of data sources, including field notes, video/audio recordings, photographs, ethnographic interviews, and children's artifacts. The methods I employed were guided by the aforementioned research questions:

1. How do children use literacy and numeracy as they play in multilingual contexts?
2. How do children use representations to negotiate borders between literacy and numeracy, and between languages?

I relied on my field notes from participant observations at B-Club as the central data source for this study. Video/audio recordings, photographs, and children's artifacts informed my

field notes. To better understand the children's interactions at B-Club, I also observed the children in their classroom and after-school program, and conducted ethnographic interviews with the children, family members, and classroom teacher. Below I describe each method in more detail.

Participant Observations

After the children and their parents signed consent forms, I began writing detailed field notes focused on the children's interactions in B-Club, the after-school program, and classroom setting. Although my observation schedule varied at times, I typically observed once per week during the fall, and twice per week during the winter when the full B-Club program was running. In the following sections I describe more details about my participant observations at B-Club, the after-school program, and the children's classroom.

B-Club

At B-Club, I aimed to "follow kids' interests" (Orellana, 2016) in the Club as I participated in and observed the children's play. I focused on how the children drew from their multiple linguistic and numeric resources to make meaning in their play, as they often created physical representations while doing so. I paid particular attention to the children's process of creating these representations rather than looking at them as products at a fixed point in time (Goodwin & Goodwin, 1996). I wrote informal jottings which I later wrote out as more detailed field notes. My notes included "thick description" (Geertz, 1973) of the children's interactions, as well as my own interpretations of these episodes (Wolcott, 1999). Additionally, with the permission of the children, I wore a GoPro camera to record interactions, which then informed my field notes. This enabled me to focus more closely on details that were not captured in my original notes (i.e., dialogue and gestures), and also allowed me to more actively participate with

the children without having to stop to write jottings or miss out on recording observations. This method was partially inspired by my previous work at B-Club wherein the children often asked me to put down the camera or notebook to participate, help, and learn. As previously mentioned, I was sometimes asked to turn off my video camera in order to help or play more. The children even made the point that I would learn more by doing the activities with them, and explained that I could write my notes *after* B-Club. Emerson, Fretz, and Shaw (1995) argue that in order to understand and appreciate the perspective of the participants, researchers "must get close to and participate in a wide cross-section of their everyday activities over an extended period of time" (p. 10). After each observation, I watched the GoPro video and wrote additional notes in my field notes. In instances when the children asked to not be video recorded, I used audio recordings and/or wrote detailed notes after an interaction. I also took photos to inform my notes.

While participating with and observing the children at B-Club, the children often asked me to join their activities. For example, children would ask me to help build a house, sometimes with specific instructions such as holding up a tablecloth as someone taped it to the cardboard or adjusting the cardboard structure. While participating, I sometimes made suggestions and/or provided materials that I thought would be helpful based on the children's particular purposes (i.e., asking if they wanted a piece of paper from the supply closet to write or draw on). I aimed to honor the children's intentions by offering ideas and asking questions that I felt would support their evolving play goals. At B-Club I had to continuously make decisions about which children and/or activities to participate in and observe, understanding that I would not be able to observe everything. This was not as much the case during Mini B-Club since all six of the children were generally playing together or in a smaller physical space. In the full version of B-Club, initially, I tried to follow the activities that involved most of my collaborators. After spending a period of

time with one group, I would switch to another activity to ensure I spent at least some time with all of my collaborators each B-Club day. I also sometimes switched when I noticed there was another camera capturing the interaction which I could watch later. Over time, I started observing some of the common activities that emerged frequently. This afforded me the opportunity to see patterns as well as inconsistencies. I continued to observe activities that were less frequent in order to have a different frame of reference. Similarly, to inform my understanding of B-Club interactions, I also observed the children in their after-school program and classroom setting, which I describe below.

After-School Program

After each Mini B-Club, I observed the children in their after-school program. When we returned to the classroom, normally the class was just starting to work on homework. During this time I wrote notes and took photos, and I helped the children (collaborators in my study as well as others) with homework. When they finished, they often chose books to read, sometimes asking me to read to them. I made note of connections children made to our previous B-Club interactions (i.e., discussions about acorns after collecting acorns at B-Club) and recorded various things I learned about the children. These observations helped me build relationships with the children early on. I stayed until all six of my participants were picked up.

Classroom

I observed the children during the school day roughly once per week during a six-month period (see Appendix). I observed on different days of the week and at different times of the day, including math and literacy blocks and developmental centers. When the children participated in individual or small group activities, I observed closely and often asked questions, circulating

between the five participants in the classroom.[9] I also answered their questions, often supporting them in their various tasks. During whole group activities, I typically sat adjacent to the group sitting on the carpet. During developmental stations I sometimes joined in their play, building houses with Legos, for example, while at other times I took a more traditional observer role, writing notes about the children playing.

Throughout the school day, I attended to the different kinds of representations the children created and followed, jotting notes and taking photos throughout. I paid particular attention to representations that reflected similarities to representations the children created in B-Club. I often followed up with the children during B-Club to ask questions about activities or experiences they had during the school day. For instance, I took photos of the children's community walk maps and asked them to describe them to me during B-Club, asking additional follow-up questions about how they created these representations.

I also observed many interactions with the children's family members, including the family reading time, "Lee conmigo." I normally said hello to the family members (most of whom I had met previously), and observed some of their reading, trying not to be too intrusive.

In addition to classroom observations, I sometimes observed the children during recess, lunch, library, and assemblies. Following the same children across these different in-school contexts, as well as different out-of-school contexts, allowed me to observe patterns and differences, and explore the ways the different contexts mediated the children's participation and practices.

[9] Natasha Bebé was the only collaborator who was not present during the classroom observations. Initially I had planned to only observe the other five for that reason, but she and her family (both Rambo Bebé and their mother) expressed interest in being included in my study.

Ethnographic Interviews & Visual Methods

Ethnographic Interviews

Viewing interactions from multiple perspectives is crucial for obtaining an understanding to improve children's learning (Dyson, 2003; Gallas, 2003; Siegel, 2006). In order to better understand the children's interactions at B-Club, I engaged in ethnographic interviews (Spradley, 1979) with the children, family members, and their teacher. I asked open-ended questions, and parents, siblings, and Ms. R shared insights and often posed questions in return. With family members (parents and siblings), I inquired about what the children liked to do at home or what they talked about in connection to school and B-Club. Sometimes instead of asking a question, I shared something the children did at B-Club, which often elicited a response. Recognizing the knowledge and perspective that families can impart to teachers (Zeichner, Bowman, Guillén, & Napolitan, 2016), I also offered follow-up questions based on interactions I observed, which helped complement, verify, and/or contrast the information provided by the children. Additionally, on classroom observation days I asked Ms. R open-ended questions about the students to learn more about them and their interactions in the classroom.

Visual Methods in Interviews

I incorporated visual methods (Dell Clark, 2011) in informal interviews with the children. For instance, I invited the children to guide me on a walk around the school grounds, attending to literacy and numeracy interpretations. This led to the children wanting me to bring in photos of the neighborhood. I took various photos, and the children discussed what they noticed and drew pictures. Additionally, I was able to take walks outside the school with three of my collaborators, accompanied by their family members. On these walks, we observed literacy and numeracy in the community (Orellana & Hernández, 1999). These interactions not only allowed me to get to

know the children and their families better and strengthen that relationship, but also provided me with further insights on their literacy and numeracy understandings.

Artifacts

In addition to participant observation and ethnographic interviews, I attended to the artifacts the children produced in B-Club, their classroom, and after-school program. In B-Club, all the children had individual journals, and could write in them and use them as they wished. I took note of when each child used the journal, and for what purpose. I also looked at how the children used various materials to make meaning. In most cases, the children wanted to keep the artifacts they created (such as cardboard costumes), so I generally took photos for my own records.[10] I additionally took notes and photos of the classroom assignments and other creations they made. In the following sections, I describe some of these artifacts in more detail as I narrow my focus on particular activities.

Data Reduction & Analysis

The data collection methods described above produced a large corpus of data. This included a notebook full of jottings, approximately 150 pages of field notes, and 30 hours of video, as well hundreds of photos of the children playing and of representations the children made during their play. Additionally, I kept the artifacts that the children gave me. Throughout the process, I organized the data chronologically and by collection method and context. I used Excel to organize annotations. After each observation, I annotated the video segments[11] and included the date, collaborators involved, and any relevant notes from my analytic memos. I

[10] In my records, I listed "artifact" when referring to the original artifact from the children's play, and "photo" when referring to a picture that I took of the artifact.

[11] The GoPro video was automatically separated into twelve-minute segments. I numbered and annotated each one separately and used color coding to display them together chronologically over the six-month period.

created a separate sheet displaying all the data across contexts (After-School Program, Mini B-Club, School, B-Club, Outside of School) and color-coded them. Throughout data collection I also showed the children videos and photographs due to their roles as collaborators. They offered their opinions and interpretations (Dell Clark, 2011). Throughout this process, I kept children's responses in the original language they used to both honor their voices and to keep a more accurate record of the data.

After completing the data collection process, I re-watched all the video and made notes in my field notes master document as comments apart from the main text so that I could easily distinguish those from later observations. I then created a list of all the activities the children engaged in during B-Club. I based my definition of "activities" on how one child described them at B-Club: "Activities are things that are fun!" This is consistent with the *Merriam Dictionary* definition by kids, which is "something done especially for relaxation or fun" (*Merriam-Webster Dictionary Online,* 2019). I used names of activities that the children used to describe them. Sometimes these were one-word names (i.e., Legos) and other times they used a phrase to describe what they wanted to do (i.e., "Writing Letters" which described the activity of making costumes to engage in imaginative play.) After creating the initial list of activities, I grouped the ones that fit in more general categories. For example, there were many different cases wherein children built homes using different materials or made different kinds of homes (e.g., a cat house). I included all of these under "Casas & Houses." Another example is the different kinds of board games (see Appendix A for full list of activities).

Once I had the full list of activities the children engaged in during B-Club, I compiled a list of the different kinds of physical representations[12] they used, then cross-referenced any

[12] These representations included the children's symbolic representations they used to express ideas through their play (Vygotsky, 1978).

similar representations used in other contexts. I looked at activities I instigated (such as acuerdos and photo stimulation), as well as the play activities that were initiated by the children. Looking at the different kinds of representations the kids created for each activity, I noted who participated, the context, and how the children's representations emerged. I then differentiated between how the children used each of the representations. I found that there were four different purposes for which the children used the various representations throughout their play:

1. Creating a representation of something to play with (house, zoo, costumes).
2. Creating a representation to use as a guide to support and/or continue their play with something else (drawing plans for cardboard construction or costumes, building something in the classroom beforehand).
3. Creating a representation to document their play (to show others what they did or to remember themselves).
4. Using a representation to explain their thinking about something that came up in the context of play.

Often the children's representations had more than one purpose, and sometimes one followed another. I looked back at the synoptic chart (Appendix B) to see how frequently these activities occurred. I noticed that there weren't a lot of activities that children went back to. I identified three activities that came up more than once over a span of time, with overlapping participants: Acorns, Casas & Houses, and Superheroes!.[13] This afforded me the opportunity to look closely at how the children were participating within the same activity, following it over time. While activities are constantly reimagined and redone at B-Club, these three activities gave me a repeated context to return to, to notice more. These activities also all included two or more of my collaborators.

[13] I capitalize "Acorns," "Casas & Houses," and "Superheroes!" when these words and phrases are used as the names of the B-Club activities.

I then focused my analysis on these three activities,[14] looking for every instance in which literacy- and numeracy-based ideas emerged in the children's representations (e.g., labeling). I noted which languages they used as they carried out these ideas (English, Spanish, Spanglish, or others), which areas of knowledge emerged within their practices (e.g., spatial awareness), and what modes of representation were used (linguistic, visual, audio, gestural, and spatial [New London Group, 2006]). I then coded for shifts in language practices and participation as I followed these interactions over time, and sorted codes by activity, participant, and context to look for patterns, as well as differences, within the sets of data (Bazeley, 2013).

Below, I describe each activity in more detail, as well as how the activities emerged, their frequency, who was typically involved, and how they were meaningful to the children.

Activities

Acorns

Collecting acorns and documenting their collections (Figure 3.3) was an activity that emerged from our explorations of the school's campus. Once the children discovered the acorns, acorns became the focus of these campus explorations. The children were especially interested in documenting the acorns – an activity which carried over into spaces where they were no longer exploring. Additionally, there were times when the children used the acorns in other parts of their play, such as to decorate a house or add weight to paper airplanes. There were also times when some of the children discussed ideas about the acorns, such as how animals eat them. Since these instances did not consist of collecting or documenting the collection, I did not include them in activity chart below. The children often talked about the acorns with excitement. When I followed up with the children after I completed my data collection, all six of them named the

[14] I focused on my field notes, then cross-referenced corresponding video, photographs, and artifacts.

Acorns activity as one of the things they liked doing at B-Club. When I went to their classroom to visit the following year, some of the children asked others if they remembered the Acorns and expressed interest in collecting more.

Figure 3.3: Acorn Activity

Acorns

Number of Days: 4

B-Club Members Involved: Rosa, Rambo Bebé, Natasha Bebé, Anthony100, Ben10, Emita, and Janelle

Casas & Houses

When we first met as a small group to talk about our acuerdos and hopes for B-Club, I started out by asking the kids if they had heard anything about the Club previously. Anthony100 told us that Jeffy, a first-grader in his class, had said last year they made lots of things out of cardboard, like houses and castles. After talking more, we made a list of activities that everyone wanted to do in B-Club, and building houses with cardboard was on their list. Over the course of B-Club, all of the children participated in numerous versions of house-building which involved a number of different children, often spanning age groups. In the activity chart below (Figure 3.4), I include those who participated in the Casas & Houses activities that I observed. However, it's

important to note that there were many more children and adults who were present, but their participation occurred outside of this study's focus.

Figure 3.4: Casas & Houses Activity

Casas & Houses

Number of Days: 13

Number of Different Structures: 23

B-Club Members Involved: Rosa, Rambo Bebé, Natasha Bebé, Anthony100, Ben10, Emita, Jeffy, Jasmine, Broccoli Leaf, Treeflower Quince One Hundred Thousand, Jasmine, Lilia & Janelle

Sometimes the children used the houses as part of their imaginative play. For example, Emita built a cat house for herself and pretended to be a cat, eating her cat food inside the house. Casas & Houses also seemed to create comfort for the children. There were a number of cases when the children voiced that the classroom was too loud for them, so went inside a casa to be somewhere "quieter." On another day, one of the B-Club children turned off the lights, so other children took my 2½-year-old, who was visiting that day, into their house so he would be "safe" from the dark.

Similar to the Acorns, all of the children named building Casas & Houses as something they enjoyed about B-Club. When, the following year, I asked Emita about B-Club, she told me that she liked the Cases & Houses activity and learned from it: "You can build things differently," she said. "I learned that not everything has to look the same.

Superheroes!

Ben10, Anthony100, and Jeffy participated in imaginative play frequently. In the early weeks of B-Club, they went to outer space in a spaceship and went to the movies to watch *Ben10* (the movie, not the kindergartner). They had an interest in superheroes, and Jasmine encouraged that interest through their play. Ben10 was the primary participant in the Superheroes! activity (Figure 3.5), most often with Jasmine and Jeffy. Anthony100 merged in and out of this play, as did Emita who explained that a kitty is a superhero too, because "kitties make you happy." Sometimes the superheroes joined in the imaginative play of building the houses, as well as other activities during B-Club; Superheroes! was a fluid activity that frequently blended with others.

Figure 3.5: Superheroes! Activity

Superheroes!

Number of Days: 5

Names of Superheroes: Captain America, SpidermanWolverine, Ben10, Lobster, Robot, Banana, Kitty, Diamond

B-Club Members Involved: Ben10, Anthony100, Emita, Jasmine, Lilia, and Janelle

Methodological Questions & Limitations

In approaching this study, I was aware that my presence as an adult researcher may have impacted the children during data collection. Although I had been a B-Club member for the previous four years, I was still an adult after all, with my own adult perspective. In many ways,

my own background was quite different from that of the children – including language, ethnicity, and geographic upbringing, among other things. I grew up in an English-dominant, middle-class socio-economic household (which differs from not all but most families at the school, as well as families in my study). I did not grow up in Los Angeles, nor did I currently live in the community of the school. At the same time, I also had some commonalities that to a certain extent helped me relate with the children in the program. As I mentioned in my personal reflection, I did grow up in a multilingual community and I did formally learn a second language in school, though at an older age. I also had been an active participant at B-Club, and some of the children had viewed me as a playmate. The children also spent some time with my two kids (at B-Club and end-of-quarter celebrations), and they often asked me about them; we shared discussions about what kinds of books and TV shows we all liked. Moreover, I recognized that each child had their own unique experiences and background. For instance, one of the collaborators was a little self-conscious about speaking Spanish. She spoke almost all English at home with her family. As I also mentioned in my reflection, I had felt this same way as a child, and could still relate to this feeling of vergüenza. We had a number of conversations about this fear, and she began speaking Spanish with and around me more and more. As Tuhiwai-Smith (2005) explains, "there are multiple ways of both being an insider and an outsider" (p. 137). Still, I knew my analyses and interpretations could never be fully complete, though I aimed to highlight the voices of the children to the extent it was – and is – possible.

There were also technical challenges to my research. At times, the acoustics of the room impacted the quality of the audio I recorded. There were also times when my hair was covering the camera, obstructing the view, since the GoPro had been placed on my shoulder. In some cases, the GoPro did not record video, but instead took thousands of photos in succession. To

address some of these issues in the moment, I focused my attention on jottings when the children were further away from the GoPro, knowing that the audio might not be picked up as clearly, and later I turned the photos into a time lapse video to better inform my field notes. However, I knew I was not able to fully capture everything that my participants said at all times. Additionally, I acknowledge that I could only see what I had been present for, and that I had only focused on these six particular children. Thus, I am not now making claims about all young children; rather, I demonstrate possibilities for how children may draw on their multilingual resources in literacy and numeracy simultaneously in their play.

CHAPTER 4: ACORNS, HOUSES & CASAS, SUPERHEROES!: HOW CHILDREN COORDINATE AND NEGOTIATE IN CREATING REPRESENTATIONS

> Anthony100 starts to write his name on the cardboard house when Rosa suggests that he write it on a piece of paper instead. He picks up a yellow page and writes his name. Next, he tells Rosa to do the same. "Pon tu nombre aquí," he says, handing her the marker. Then he motions to Emita and tells her, "write your name," pointing to the space below Rosa's. After the others add their names, Rosa hangs the paper on the top of one of the house's walls facing the other group of children. Anthony100 keeps it in place by using tape while Rambo Bebé begins to draw flowers on the sign.

Interactions such as the one described above were common at B-Club. As they did with this cardboard house, the children often actively negotiated decisions about what kind of representation was most helpful to them based on their evolving goals during the activity. These initial negotiations often led them to make additional decisions regarding when and how to collaborate, as well as what languages and modes of communication to include in their representations. In this chapter, I explore how these children drew on their multilingual resources in literacy and numeracy to create representations in their play.

I begin this chapter by discussing the importance of children's ability to negotiate decisions about how and what they learn. I also discuss translanguaging as a tool for collective thinking. I then explore how the children collaborated and negotiated decisions about representation through their play during three different activities: Acorns, Houses & Casas, and Superheroes!. I include detailed examples to illustrate how the children: (1) make choices about when and how to collaborate, and (2) shift and/or combine languages and modes of representation – and how they make these decisions based on intent and audience. I then discuss the language demands embedded in the children's negotiations surrounding representation, highlighting literacy and numeracy practices involved. I end the chapter with a discussion of the

mediating impact of the B-Club space on the ways in which the children negotiated their representations.

Children's Ability to Negotiate Decisions about How and What They Learn

At B-Club the children negotiated decisions based on their own goals and purposes. Learning opportunities that support children in making decisions about how and what they learn, often referred to as *agentic learning* (Adair, Colegrove, & McManus, 2017), are important for expanding "children's capabilities beyond the acquisition of a narrow range of content" (Adair, 2014, p. 219). In order for children to develop as capable thinkers, they need to be able to explore, ask questions, theorize, and try out their own approaches and evaluate them for themselves (Genishi & Dyson, 2009; Paris & Lung, 2008), just as the kindergartners did through their play at B-Club. Zentella (1997) frames language choice as a form of agency wherein translanguaging functions as a way for children to negotiate meaning.

Considering the benefits of creating more space for agentic learning, there is documented concern among educators and researchers in regard to unequal access to these rich learning opportunities (Adair, et al., 2017). Consistent with findings that show schools in underserved communities tend to offer fewer opportunities for playful learning than do schools located in higher socio-economic communities, research demonstrates that children of color, children from immigrant backgrounds, and children from lower socio-economic families have less access to agentic learning experiences in early education than do children from higher-income, European American backgrounds (Fuller, 2007).

In their play, which I describe as an agentic learning opportunity, the kindergartners at B-Club drew from translingual resources in literacy and numeracy as they engaged collectively in problem-solving, discussion, and critical thinking. This type of collaboration, along with

autonomy and self-efficacy, is connected to children's ability to negotiate decisions about what and how they learn (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001; Kamii, 1991). As the children played at B-Club, they continuously negotiated meanings through "clarification questions, confirmations of meaning, and adjustments to what was said" (Gibbons, 2009, p. 134).

Translanguaging as a Tool for Collective Thinking

The children used translanguaging as a tool for their collective thinking as they negotiated decisions in their play. They used language as a tool in the Vygotskian sense, for "constructing knowledge, creating joint understanding, and tackling problems collaboratively" (Mercer & Littleton, 2007, p. 137). Martin-Beltran (2014) and Wei (2014) have connected this concept with translanguaging to acknowledge that in multilingual contexts, such as their school and community, children draw from the multiple linguistic resources to represent their ideas and make meaning (Martin-Beltrán, et al., 2017).

Studies have shown that collaboration involving fluently attuned participants oriented toward a shared goal (Mejia-Arauz, Rogoff, Dayton, & Henne-Ochoa, 2018) can enhance the quality of the learning process for students (Papageorgiou & Lameras, 2017). Students working collaboratively in groups have the opportunity to share their thoughts and prior knowledge. In B-Club, the children engaged in translanguaging, including multiple modes of communication, for a variety of shared purposes (outlined again below) as they played together. Papageorgiou and Lameras (2017) show that multimodal collaborative learning can promote the idea of creating learning opportunities with shared purposes and create opportunities for children to make sense of particular disciplinary practices.

Rogoff, Coppens, Alcalá, Aceves-Azuara, Ruvalcaba, Lopez, and Dayton (2017) found that children from indigenous-heritage backgrounds often engage in "sophisticated

collaboration" wherein "children think together, fluidly blending agendas and ideas with each other. They are attentive to each other's efforts, flexibly adjust their own actions to align with the direction of the group, and take initiative when they see what needs to be done and support others in doing the same" (p. 880). The authors differentiate this from the ways in which children from middle-class European American backgrounds tend to divide up tasks or materials in ways that do not allow for collective thinking.

The flexibility, attention to others, and ability to blend ideas that Rogoff and colleagues (2017) describe as being involved in "sophisticated collaboration" is in line with the ways in which children use their full linguistic tools flexibly and fluidly to make meaning, as well as the multilingual awareness (MeloPfeifer, 2015) encompassed by translanguaging. The interactions in B-Club reveal how the children used translanguaging as they negotiated decisions regarding representation. At times their collaboration mirrors how Rogoff et al. (2017) describe "sophisticated collaboration," while at other times the children decided that their goals were in fact best served by taking turns or dividing up materials. The children drew on their multilingual resources to produce, use, and sustain collaborative and meaningful representations in their play. This was revealed through interactions during the children's Acorns, Houses & Casas, and Superheroes! activities, highlighted through the data excerpts in the following section.

Negotiating Decisions about Representation in Acorns, Casas & Houses, and Superheroes!

During their play, the children developed representations that they used to support themselves in their play. As mentioned, the children created these representations to: (1) play with (i.e., houses, costumes they made); (2) use as a guide to support/continue their play; (3) document their play for themselves or for others; and, (4) explain their thinking about something that came up in the context of their play. Often representations had more than one purpose.

Sometimes one purpose was more immediate and another followed from it. Some representations led the children into various forms of collaboration, while others did not. Some of this collaborative work came as the children created their representations, but much came as they negotiated what kind of representation to create in the process of discussing different ideas and trying them out before making a collective decision.

Below I describe interactions from the Acorns, Houses & Casas, and Superheroes! activities, illustrating how the children negotiated decisions about the kinds of representations they made and how they used them, and instances when this lead to (1) making choices about when and how to collaborate, and (2) shifting and/or combining languages and modes of representation.

Acorns

For this activity I describe, in chronological order over four days, interactions of both collecting and representing the acorns in order to show the children's negotiations, and how they progressed over time.

Day 1

After talking about our acuerdos, we set off to explore the school. This was the children's first "activity" in B-Club. They seemed particularly excited to explore the upper fields of the campus because, as they told me, they don't get to spend much time there. This was consistent with the overall sentiment we've heard from B-Club members over the years: they don't have many opportunities to really explore the grounds of their school.

Once we were out on the field, I asked some questions to find out what kinds of things they were noticing. "What do you see? ¿Que se nota?" As they continued to walk around, they mentioned different things, like arboles and "I see paint," pointing to the mural on the wall. They

also noticed things outside of the school grounds: “I see cars passing,” and “Este edificio es big, big, big.” Then the group started to spread out a little bit, looking at different things. I was standing next to Ben10 and Anthony100, looking at the mural. That’s when Rosa and Rambo Bebé ran towards us, simultaneously yelling, “Mira, acorns!”

Rosa and Rambo Bebé each held up an acorn, and this is what led the group to collecting acorns together and making decisions about which kind of representation was most helpful to them, based on their collective and individual purposes.

> The other children follow Rosa and Rambo Bebé back to the tree and start looking for more acorns. “Anthony100, ten,” Rambo Bebé tells him as she puts some acorns in his hands. More of the kids start handing acorns to him. “Miss, another acorn.” Rambo Bebé hands me one also. Anthony100, who is now using both hands to hold the acorns, announces, “Okay, I cannot get this many acorns. I’ll put the acorns right here.” He walks over to the sidewalk and puts them into a pile. Rambo Bebé and Natasha Bebé add more to the pile, and go back to the tree, talking about where they can find more. Rambo Bebé looks down at the pile and says, “That’s a lot of acorns.” Ben10 nods in agreement and gazes down at the pile. “Look, I can take a picture of those acorns,” he explains. Ben10 and Anthony100 both look at the photo of the pile of acorns, which is spread out (Figure 4.1). Rosa yells back as she points, “Acá hay más acorns.” Rambo Bebé adds, “Sí, allí hay muchos.”

What began as individuals collecting acorns turned into a collaborative effort to combine collections into a single pile. The children were mostly focused on the quantity they collected, demonstrated in their collection efforts as well as their observations and language using “más” and “mucho” and “a lot.” They used gestures and words, such as “acá” and “allí” to direct the group to find more and more acorns. Ben10 suggested taking a photo of the pile as a way to document the quantity. Next, Rosa described the size of the acorns, which shifted the focus from quantity exclusively to the physical qualities of the acorns, leading the children into descriptions and comparisons.

Figure 4.1: Pile of Acorns

> Rosa and Anthony100 are standing near the tree. Rosa runs up to us and says, “Son baby, son babies acorns.” Rambo Bebé gets up from looking at the pile and asks about the big ones: “¿Y los grandes?” and walks back over to the tree. She tells the others about both sizes: “Son grandes y babies.” Ben10 shows me: “Ooh look that is a bigger rock.” Rambo Bebé adds more acorns to the pile, including “a little, baby acorn.” Anthony100 picks one up, “a green one.” Ben10 and Anthony100 find more “baby acorns.” Rambo Bebé points to another area and says, “Más baby acorns.” I ask, in English, why they think some are small and some are big; Rosa responds, “Porque están creciendo,” explaining how the seeds are growing. Natasha Bebé picks up a rock and says, “This one is not an acorn,” and moves it aside. She picks up an acorn and says, “This one has an hoyo. Two hoyos. It looks like eyes.” Ben10 finds “a bigger acorn” and shows it to the others. Rambo Bebé grabs it and says, “Oh, bigger acorn.” She adds it to the pile and Rosa kneels down across from her.
>
> Rosa’s comment to the group about baby acorns shifted the children’s attention to size.

As the children began to describe the sizes and colors of acorns, they also made comparisons.

Rosa seemed to understand the relationship between time and size when she explained why the

acorns were different sizes. Natasha Bebé then used a metaphor to describe the two holes as eyes. Next the children expressed an interest in continuing the activity with the acorns, and a desire to show others their collection, negotiating the best way to transport them.

> Rosa wonders how we will bring all the acorns with us. She asks, "¿Cómo los vamos a llevar?" Rambo Bebé adds, "Para enseñar a Miss," referring to their after-school teacher. Ben10 asks if we have a plastic bag. We do not. Rosa suggests, "Ya lo sé, cada uno hay que llevarlo," cupping her hands to show how everyone can carry some. Ben10 asks me, "How many acorns do we have?" I tell him that I don't know (I didn't – there were a lot!) He suggests using the camera again to document how many we have. Ben10 takes the photo. Rosa looks at the photo, shaking her head, and explains it would be better to count them: "No, mejor contar." The photo shows the acorns, but some of them are underneath others, not visible in the photo. She skips over to Rambo Bebé and the pile, and says, "Estamos contando." The two begin counting together: "Uno, dos, tres, cuatro…" Rosa says, "¡Espera ya me confundieron!" They decide it will be better to take turns. Rosa starts over with counting, touching each acorn as she counts. When she finishes, Rambo Bebé counts to check. Anthony100 suggests writing the number on my phone (we don't have any paper) so we don't forget.

The children continued collecting more acorns, and ultimately decided they could put them in my backpack. Even though we had photos and the number now recorded, they wanted to re-count in order to include the new ones and look at them more closely, to "see all the acorns." The children continued to pick up more acorns as we walked back, dropping them into my backpack. They also wanted me to bring paper next week so they could draw and write down how many acorns they had. I asked if they would each like an explorer's journal, and they seemed excited about that idea. When we were back in their after-school classroom, Anthony100 smiled and said, "that was really fun when we counted the acorns." Rosa and Rambo Bebé were reading a book and pointed to a photo of a squirrel; Rambo Bebé said that "ardillas eat acorns." Later, both of them mentioned that they were excited to tell their moms how many acorns they had.

As the activity wrapped up, the children negotiated how to best represent the acorns. When Ben10 asked how many we had, he decided to take a photo. After viewing it, Rosa suggested counting as a better alternative, which seemed to show an understanding of perspective – knowing that not all of the acorns in the pile were in sight. Rosa and Rambo Bebé began counting together, but realized that that was not productive: when they began to count separately and checked each other's count, they found it was a helpful way to make sure they had the correct amount. Ultimately, Rosa and Rambo Bebé found a way to keep the actual acorns, which together with the photo and counted number helped them continue the activity and share about it with others, i.e., family and the after-school teacher.

Day 2

On our second day together, we began by reviewing the acuerdos we created the week before. Emita was now with us, and the other kids explained what we did, using English when they spoke to her directly. Emita had already heard about the acorns and told me during the school day that she was excited to see them. I passed out the journals and gave the children crayons and markers with which to write their names and decorate the covers. As they wrote, I pulled out the bag of acorns.

> When Rosa finishes writing and decorating, she begins counting a sub-pile of acorns. Moments later, Anthony100 picks up some of the other acorns and carries them back to his journal. Rosa counts one-by-one in Spanish, moving each acorn from the original pile into another. Rambo Bebé says she will count next, to check like last time, which she does. Emita and Rosa both watch. Once Rambo Bebé finishes counting in Spanish, Emita counts in English. Rosa and Rambo Bebé both observe her counting aloud until Emita announces "31." "Let's write it on a piece of paper," she suggests, and the others nod in agreement. I ask if they want to use their journals. Rosa replies "no" and picks up a paper. Emita picks up a crayon and tells us that she is going to write the number instead of the word. "How come?" I ask her. She explains, "I write the word when I want it to be in English *or* Spanish." She then asks if "31" is a "3" and then "1." I nod. Rosa and Rambo Bebé write the number too. Rosa asks if she can give the piece of paper to her

mom to show her. Later, when Emita's mom comes to pick her up, she hands her the piece of paper to show her the "31."

The children followed the same pattern they had decided on the day before, taking turns counting and checking. On this day this was done in both Spanish and English, as Emita checked by counting in English. This day also differed because we had paper and writing materials, which impacted the ways in which the children represented the acorns, both in counting and in drawing. After finishing counting, Rosa and Rambo Bebé shifted their focus to smaller groups of acorns. Some of the other kids had been writing in their journals, some about the acorns and some about other things. Ben10 had drawn himself and superheroes he liked. Emita began to draw a picture of her brother. Others drew representations of the acorns.

> Anthony100 draws five acorns in his journal. I ask him to tell me about "the one inside the other (concentric) circle," and he explains, "This one is bigger and this one is small," pointing to the respective circles which represent acorns. Above his drawing, he labels the acorns, "acn." Rambo Bebé draws tallies in different colors in her journal. She counts, "Uno, dos, tres, cuatro, cinco, seis." I look back at Anthony100's journal and ask him to explain his drawing. He points to the figure next to the acorns and says that it is himself. The drawing shows him collecting and counting the acorns (Figure 4.2). Natasha Bebé comes over to me and says, "Mira, Miss." She points to her journal and says, "Los hoyos." I look down and reply, "Ah sí, se parecen los ojos." What she drew did look just like a pair of eyes, like she had described on Day 1. She explains that the other drawings on the page are the sun, a cloud, and herself (Figure 4.3). Ben10 looks at Anthony100's drawing and asks me if he can take a photo of the acorns he has. I ask if he wants to draw them like the others. He explains that the photo would show what the acorns actually look like, and that he wants people to see them. He takes a photo.

Figure 4.2: Anthony100's Acorn Drawing

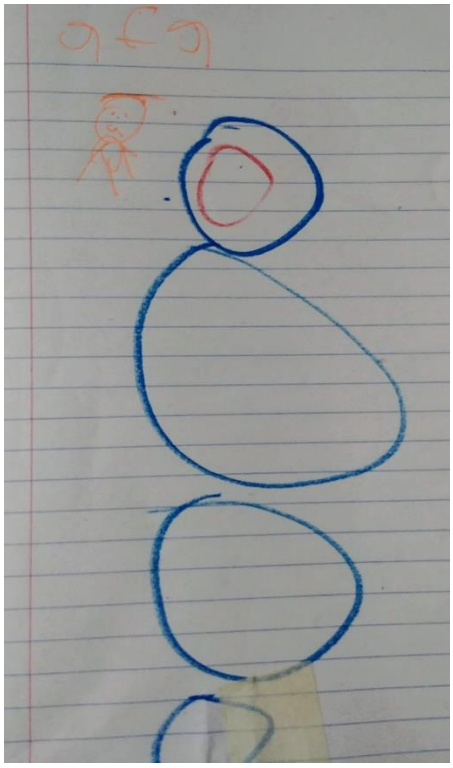


Figure 4.3: Natasha Bebé's Acorn Drawing

Anthony100 focused on the size and comparisons of the acorns in his drawing, as well as their relationship to him. He included drawings in conjunction with the label in his representation to describe the acorns in context. Similarly, Natasha Bebé focused on the descriptions of acorns in her drawing by including the holes she had previously noticed, with a picture of herself and the environment (the idea of including themselves in their drawings will be further discussed in detail in the following chapter). Ben10, on the other hand, wanted to take a photo instead of drawing pictures like the others. He justified this by acknowledging the differences in what the representations offer. While the drawings allowed some children to focus attention on certain features of the acorns (i.e., size and holes) and include the context of them physically collecting the acorns (as drawn by Natasha Bebé and Anthony100), the photo that Ben10 took showed the "real life" image of the acorns.

I went back over to Rosa who had written "Bebé" and "Baby" in her journal. I asked why she wrote it in both languages, and she responded, "Porque sí." She then added, "Para enseñar a Emita. Los baby acorns." Rosa had explained that she wanted to show her representation to Emita, who had not been there to see the baby acorns on Day 1. Rosa always spoke to Emita in English when she spoke to her directly.

Day 3

After the second day with the acorns, we somehow lost the collection. The children had expressed an interest in finding more, but the school had decided to limit B-Club participants to just the multi-purpose room and in the playground area, where there were no acorns. The interest persisted, so I asked if I could take the children as a small group on a non-B-Club day. That day, Day 3, the children went straight to the trees and started making a new pile of acorns. They wanted to find even more than last time. Emita's mom and brother came to pick her up early, as

they often did, and she was disappointed. Anthony100 said they could wait to count and look at them until next time so she could help. The others agreed. After collecting more acorns, the children eventually put them, and some rocks, into my backpack.

From this interaction we see how the children viewed the process of *representing* the acorn collection as an important and collaborative part of their play – just as important as the actual *collecting* had been. Emita did not want to miss out on this part, and after Anthony100 made the offer, they all agreed to wait until they could all do it together.

Day 4

Although we had planned to count the acorns on the next day we were together, other activities caught the children's interest. It wasn't until a week later that Rosa asked if she could count the acorns. This time, she sorted them one-by-one before counting.

> As Rosa places each acorn into one of four groups based on size, she names the category aloud. Each acorn is labeled either "gordo," "grande," "mediano," or "baby." She also places the rocks around the acorns (Figure 4.4). She counts the acorns after she finishes sorting. "Hay más grandes," and she takes a photo. I ask if she wants to draw them, and she says no. She explains that taking the photo is "más facil."

Figure 4.4: Rosa Sorting the Acorns

On this day, Rosa focused on the size of the acorns before counting. She categorized them by size and separated them from the rocks in her design. She counted the individual groups in order to compare their quantities. She ultimately decided to take a photo, which was the quickest and easiest way to capture both the overall quantity and relative sizes of her different categories. Rambo Bebé and Natasha Bebé, who had been watching Rosa, took a turn and sorted the acorns into the same categories, taking turns between them and checking with the other to make sure they were both in agreement. There were a few disagreements over acorn categorization, and in these cases the girls held the acorn in question closer to the corresponding piles to make the final decision. This was the last day the kids played with the acorns, though they continued to talk about them for nearly a year.

Making Choices about When and How to Collaborate

Rosa and Rambo Bebé initially brought up the idea of acorns, which quickly captured the others' interest. The children shifted from making multiple individual collections to all working together as they compiled their acorns. The direction of the activity was determined by both verbal and non-verbal communication, often with gestures, such as nods, and attention to each other's movements and actions. Their collective activity created a purpose for the children to make shared decisions, making choices that impacted how the group approached their representation.

This opened up space for the children to ask questions, listen to each other, and add suggestions, as well as respond to non-verbal communication. When discussing how they should represent the acorns, the children alternated between speaking in first person singular and first person collective, even when activities were clearly meant for the group's benefit. For example, Ben10 said, "'I'" can take a photo," when he was volunteering to take one on behalf of the

collective. Later, Rosa used the collective form in Spanish when she said, “Estamos contando.” I saw the children decide that it was helpful to work on the same task at the same time in certain cases, i.e., thinking together, while at other times it made more sense to take turns. For example, the children moved together to different trees to add the acorns together, but in another case they opted to take turns when they decided it was more productive to count and check, which they did several times throughout the different days. This was only after first trying to count together and discovering for themselves which approach to working together felt more helpful.

Shifting and/or Combining Languages and Modes of Representation

The children’s negotiations about representation based on purpose and audience sometimes led to shifts in language, the combining of languages, and the employment of different modes of representation. When Emita counted the acorns, she said the number aloud and additionally wanted to write it down. She chose to write it in a way that could be read in both English and Spanish, i.e., by writing the numeral. Emita seemed to be aware that written numerals can be read in both languages whereas a number in word form is written and read in one language or the other. (This understanding was also demonstrated in her classroom when she wrote the word “cinco” in Spanish during an activity wherein she copied down environmental print[15]. At that time I asked her why she wrote the word instead of the numeral [the poster had both], and she told me, “If I wrote the number it could be Spanish or English. I wanted to write it in Spanish.”) After counting the acorns. Emita wrote the numeral “31” which, in this type of written form, represented both languages that the children had counted in. It documented their acorns and counting as a way to share with their family members and amongst themselves.

[15] Environmental print includes print in everyday life (i.e. print in signs and logos).

As Ben10 watched Anthony100 draw his representation, he decided he wanted to take a photo instead. He was aware that the photo offered different affordances, such as showing the actual acorns, for the purpose of showing others who had not seen the original ones. Meanwhile, Anthony100 combined both linguistic and visual representation through his drawing and label, to put the acorns and himself into context. Natasha Bebé, who also drew herself with the acorns, used her drawing to focus the attention on what she earlier described orally – the hoyos.

In the last interaction, Rosa sorted by size, using spatial modes of representation to separate the acorns into groups. She took a photo, which she explained was easier than drawing. Separating out the acorns enabled her to use this form of representation to demonstrate quantity and size, as opposed to the other photos which simply showed a pile of acorns, making it impossible to count them individually.

Casas & Houses

Throughout their time in B-Club, the children created a variety of representations of houses to use as part of their play. Just as we saw with the children's acorn collections, the children negotiated decisions about their representations based on their purpose within their play. Similarly, as the children made decisions according to their purpose and audience, we see choices about when and how to collaborate, as well as shifts and/or combinations of languages and modes of representation. This was true for the representation of their houses as well as other representations that emerged in the context of this activity. In what follows, I detail interactions that highlight these negotiations in (1) making the housing structures, (2) adding labels, and (3) drawing maps.

Making las Casas

The children created a variety of houses to play with during B-Club, including individual homes, multi-room houses, cat houses, and houses with outside patios. In all of these cases, the children drew from their literacy, numeracy, and language understandings as they made decisions about size, layout, features, and more. These decisions were often negotiated in discussions, trying out ideas, or drawing out ideas beforehand. The following excerpts demonstrate typical interactions among the children as they made decisions about how to represent their homes using the various materials available to them.

Before starting to build their first houses, many of the children opted to use their journals to draw plans for what they wanted to build. Anthony100 said he wanted to build a house. Ben10 drew four cubes connected together in his journal and showed Anthony100. Emita asked, "You know what I'm going to make?" and then continued to draw more. One pair of children began building a structure together, while Emita began building an individual house. When Rosa asked Emita to join, the question of space came up, which was addressed through adjusting the design and structure to meet the new purpose of Emita's original house.

> Anthony100 and Ben10 unfold flat cardboard boxes to turn them into cubes, then go inside. Emita does the same and closes the top. Rosa asks Emita, "Can I share?" Emita tells her, "There's not enough room." I ask if they want to try building something in which they could all fit. Rosa nods. Emita opens up her journal and starts adding to her drawing. She then tells Rosa and Rambo Bebé, "I'm going to see if all of you fit together." Rosa points over to more cardboard and tells them, "Allá hay una box." The three of them carry it over and connect it to make more space. "Now it's higher," Emita says. Rambo Bebé says, "Es más grande." Emita says she wants to cut out a space for a window so people can see her. Rosa explains she wants to cover up all the sides because the other kids are too loud. Emita agrees, and they fold the top in. Anthony100 tells Ben10 they also need to make their house bigger. He attaches another box with tape. He closes the top to make a "roof" with the tape.

Emita acknowledged that there was limited space to include other children in her house, and responded to my question by redesigning her original plans. Rosa located more materials, and the group found a way to attach more boxes to create space for more people. Emita seemingly understood the idea of using space to connect with people when she expressed wanting to make a window so that people could see her. This idea prompted Rosa to suggest covering all the open space, including Emita's proposed window, to better separate them from the louder older kids. Emita agreed, and the three partitioned the cardboard to cover up the open roof and did not make the window. Meanwhile, Ben10 and Anthony100 added more materials to create more space and made a roof to "block out noise."

On another day, all six children decided to build one big house together. Initially, all of them started bringing over cardboard and configuring it. Then two children, Rambo Bebé and Natasha Bebé, shifted to decorating the house. In some cases, the children engaged in imaginary play and turned back to make adjustments or additions to the house to fit their play needs.

> Emita takes her box and blanket over to the other group. Rosa and Anthony100 use this and other blankets to cover one whole table, taping them and using the notebooks as weights. Rambo Bebé colored flowers and a heart on the box, which was suggested earlier by her sister because they look "nice." Natasha Bebé is coloring with a green crayon on top of the box. I ask, "¿Que están haciendo?" Rambo says she is doing "decoraciones para la casa." Natasha Bebé further explains the decorations are for making the house beautiful, "Para que sea bonito," and adds a cross. Emita drapes the blanket over the second table, next to the two blankets Anthony100 and Rosa put up. Emita tells Anthony100 she needs tape. "This much?" he asks as he unrolls a piece and holds it up to her. "A little more," she tells her, and Rosa agrees. "Si, más." Rosa makes another box into a cube and starts to put it under the other side of the table. I ask Rosa why she's using the tape, and she explains, "Para cubrir todo." "¿Por qué?" I follow up asking why she wants to cover it all. She further explains that she doesn't want the other children to see "Para que ellos no pueden ver."

Here the children worked together to build their house, creating space and different rooms so everyone can fit inside; they also attended to the aesthetics of the house by adding

decorative features. Earlier, Rambo Bebé had the initial idea to add decorations and asked Natasha Bebé what she should draw. Thus, they collaborated to add flourishes that made the house feel homey and pretty. As with the acorn/rock design, they are attending to aesthetics as well – something school learning often does not leave room for. Meanwhile, the other children focused on building the structure. They moved parts of cardboard together and discussed the amounts of materials needed, such as the tape. Their spatial work on the house lent itself to using informal math vocabulary, and the children used both English and Spanish, as well as gestures, to do so. Once again, the children were motivated to close space to create privacy from other children. In this interaction, we saw the children make choices about how to best collaborate in the moment. Rambo Bebé expressed to me that since there were already a lot of children building the structure ("Ya están muchos."), she wanted to make it nice. She and Natasha Bebé were attuned to what the others were doing, and without discussing it aloud, shifted their work to the decorations.

> As the children continue to make their representation of their house, they start taking on family roles in imaginative play, which in turn leads them to adding on to their house design. When I hear Natasha Bebé call Anthony100 "Papá," I ask if he is the dad, and he nods. Rosa tells me that she is the mom: "Soy la mama," then Rambo Bebé says, "Yo soy el perro." Emita adds, "I want to be a puppy, too," then barks. Emita and Rambo Bebé then begin to build an addition, which I later find out is a patio.

They explained their reasoning in the following dialogue excerpt, which began when I asked about the door I saw them building:

Janelle:	¿Es una puerta? (I point to the cardboard door, asking if it is indeed what it looks like).
Rosa:	Sí, hay dos entradas. (Yes, their house has two doors).
Janelle:	¿Por qué hay dos? (I ask why two).
Rambo Bebé:	Porque tenemos un patio. (She explains that they have a patio, implying that the second door was connected to the patio).
Emita:	For the puppies.

At this point, I start to lift one of the blankets draped over the house.

Multiple kids: No!
Rosa: Esa no es la puerta. (Rosa explains that the blankets I am lifting are not the door).
Emita: The door is over here. (She points).
Rambo Bebé: ¿Quieres entrar? (She asks me if I want to come inside).
Emita: We're hiding from the wolves. We have to close the door so they can't find us.

I go inside the casa and see that the children are spread out into different areas. Rosa asks Emita, "What are you doing?" She tells her, "I'm making a window so we can see each other. I'm also hanging the acorns." She places them on the wall by the window to add to the decoration. The window is in between two "rooms."

Later, as I look at the drawings some of the kids made of their house, the kids talk about how they had designated rooms in the house to each other. For instance, Rosa said "la sala" was for Anthony100, el papá.

Here the children negotiated their roles in their play that led them to adding features. In the previous interaction, Emita shared that she wanted to have a window to see others, yet Rosa wanted to cover up space for privacy. In this case, they found a way to do both by building an interior window. Emita and Rambo Bebé also worked together to create a patio after they decided they were puppies. In other instances, children added three dimensional features to their houses to fit their roles in imaginary play, such as adding a cat door to the cat house and a coat hanger for the parents.

As they negotiated decisions about building the house structure, the children engaged in collective translanguaging, or what Lee, Hill-Bonnet, and Gillispie (2008) refer to as "tandem talk," with children listening to another child in the group in one language and responding in another as they communicate (see Figure 4.5 for an image of the house). This type of collaborative practice involves speakers coordinating the use of multiple languages so that each

individual maintains the use of monolingual talk in a bilingual or multilingual conversation (see also Gort & Pontier, 2013).

Figure 4.5: Building la Casa

Adding Labels

At times the children added labels to their houses. Sometimes these labels were intended to communicate ownership by including whose house it was or to indicate who was or was not invited to come into the home. Other times the labels were meant to show where the door was located so that people knew where to enter. In these cases, the children used the labels to support and continue their play, and to address questions that came up during their activities. In these interactions, children negotiated when and how to use the labels, including what language(s) and materials to use, based on their purpose and audiences.

> Someone bumps into the house and the roof collapses. Natasha Bebé comes out to help drape the tablecloth again. Rosa tells me that other kids keep trying to come into their house and are ruining it. After suggesting that they invite others into their house (Rosa and Anthony100 say no), I ask if the others knew it was their house. Anthony100 says he has an idea and walks over to the arts and crafts table. He writes his name on a small

> piece of paper and brings it over to put on the house. Rosa looks at it and smiles. She says they should put it somewhere where everyone can see. They continue to put the roof back together. "Más allá," explains Rambo Bebé. "No, arriba," Rosa says.

Anthony100 labeled their house to communicate ownership. He chose to do this by writing his name on a piece of paper. This was likely in response to the other children bumping into the house, and my question about whether they knew whose house it was. Rosa then shared spatial knowledge by saying they should put the piece of paper somewhere visible. Rambo Bebé and Rosa used spatial language as Anthony100 moved the label to a suitable location.

On another day, Rosa, Rambo Bebé, and Natasha Bebé built a house with two second-graders, Broccoli Leaf and Treeflower Quince One Hundred Thousand.

> Rambo Bebé asks for "un papel grande." I bring back some paper, and Rosa begins copying the names of people who are building the house (using the envelopes addressed to each of the students from "el Maga"[16]). Natasha Bebé explains that "you have to have your name on the paper if you want to enter." Rosa takes my photo off the wall and begins copying down my name. Natasha Bebé starts to write out a sentence telling others to write their names if they want to enter, "Si quieres entrar, póngase tu nombre abajo," as Rambo Bebé helps with the sounding out of the letters. Rosa writes more names on the sign (Figure 4.6). I ask if everyone in B-Club can read the sign. Rambo Bebé responds that they should also write it in English, but Natasha Bebé says no and explains that it's better to just have Spanish; fewer people will know to write their name because they don't have enough space for everyone: "No hay mucho lugar." Moments, later, Cammy comes up and says she wants to help. "¿Va vivir con nosotros?" asks Rambo Bebé, wondering if Cammy wants to live with them in the house. Cammy smiles. Natasha Bebé tells her, "Put your name here." Cammy writes it first in English and then in Korean: "I'm going to write my Korean name." She writes her sister's name too. Rambo Bebé then explains where each of them will live: "Cammy va a vivir en la sala con las otras, y nosotros tres aquí."

[16] "El Maga" is a mysterious, gender-ambiguous character who writes to the children of B-Club and other UC Links after-school programs. Sometimes el Maga writes individual letters or in children's journals. Other times el Maga writes to the collective group on a large piece of paper or scroll.

The children created a sign-up sheet that served as a collective label (Figure 4.7). They negotiated decisions about translation based on their intentions and on size constraints. After including another child in their house, they begin discussing how to separate out space.

Figure 4.6: Rosa Labeling the Casa

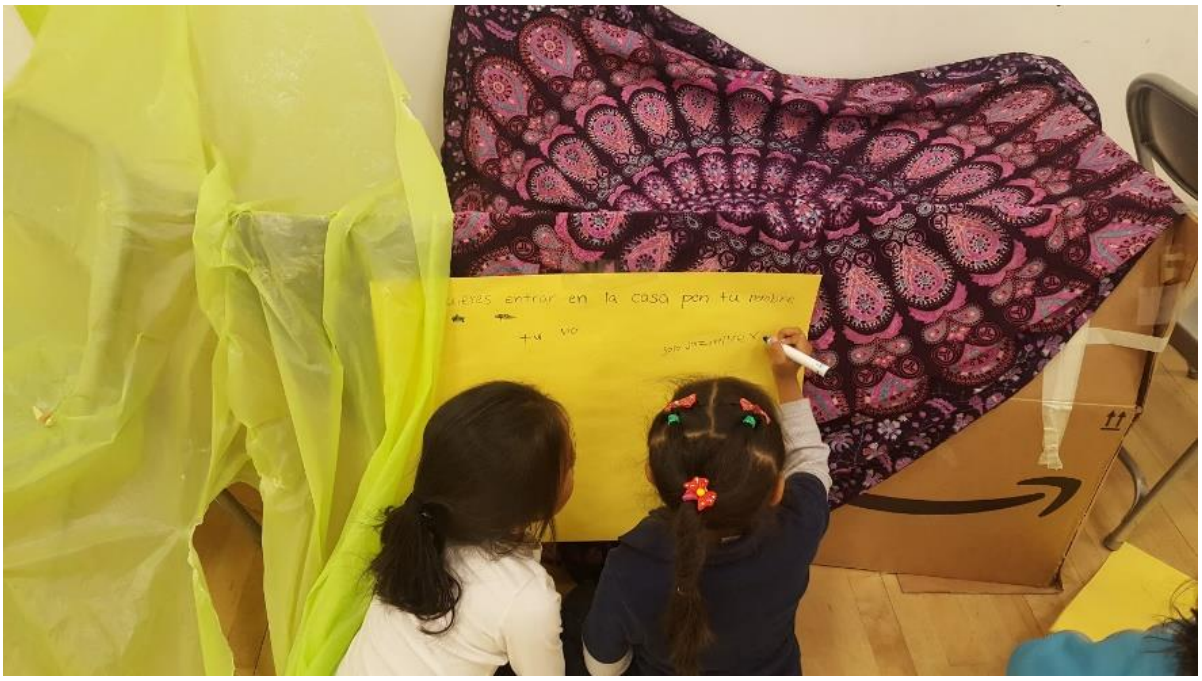
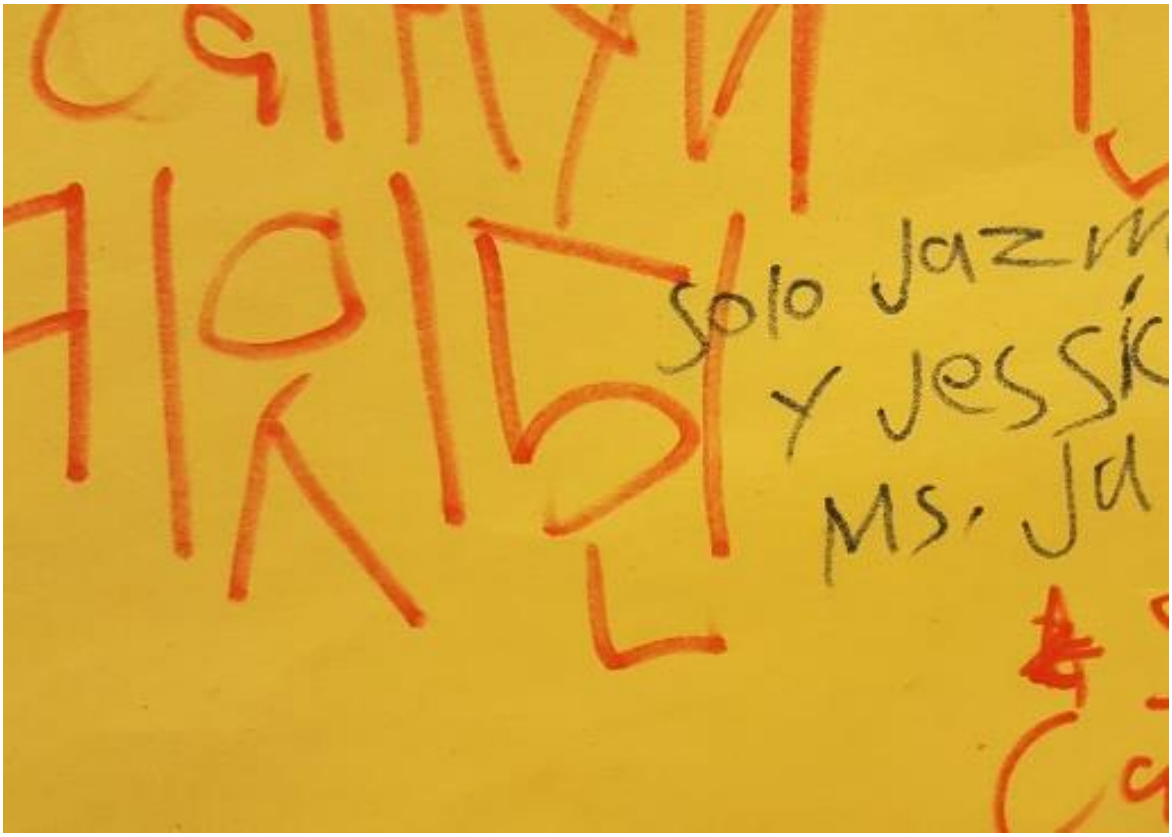


Figure 4.7: Collective Label



Other days the kids used labels to show where the door was located, writing "puerta" or "Enter here" directly on the house or on a separate piece of paper that they would affix to the house. There were times when the children did choose to include a direct translation, when they wanted everyone to understand. For example, Rosa wrote "No entre," and "No entr" (displaying beginning and ending sounds) to communicate that no one should enter their house. There were other instances when, in addition to using labels on the houses, the children also incorporated labels in their drawings and maps of their houses, which I discuss in the following section.

Drawings & Maps of Houses

When the children drew maps, it was sometimes to continue/support their house-building, other times to document it, and other times to answer a question that came up in the course of

play**.** There were several instances when one or more of the children drew maps and/or drawings of their houses. The first time the children built houses, many of them drew plans in their journals, generating ideas for what they wanted to build. Other times, the children drew representations of what they had already made, and in some cases they continued to add details as they built. Sometimes these maps were used to continue or support the children's construction and play, at other times the maps were used to document their houses, and sometimes a map would be created in response to a question. Some of these maps and drawings included labels to show orientation. To illustrate how the children typically used their maps/drawings, I highlight examples from the original interactions I detailed in the previous section.

The first day the children built houses, some of them started with drawing pictures and maps to brainstorm ideas and plan out how they wanted to approach their construction. Ben10 initially drew four cubes connected together in his journal, which he then showed Anthony100. Together, they carried out this plan by unfolding broken-down cardboard boxes and taping them together to create a bigger house. That same day, Emita drew an initial plan for her individual house. When Rosa asked to join her, Rosa decided to create a bigger house, which prompted her to return to her drawing. She turned her initial cube into a star shape with a rectangular extension, and later explained it was designed that way "so that everyone has their own room." In both of these cases, the children used the drawings to support their building of the houses. A few weeks later, Emita did revisit her drawing, reflecting on the building process. "Remember when I was trying to make this?" she asked me, "It was hard." She said she learned that it's too hard to make star shapes, but she likes having it to show people.

In these instances, the children used their drawings to support their play. Emita and Rosa referred to Emita's drawing throughout their play and as they added and maneuvered cardboard

to build the house. Emita also used the representation as a documentation of what she did, both to show others and for herself.

On the day that all six children built a house together, most of them drew individual maps of the house before it was time to dismantle the house for clean-up.

> I tell the group we have about 10 more minutes before clean-up and Emita announces that she wants to draw the house so she will remember how they built it. Anthony100 adds, "We can build it again," and grabs his journal. Ben10 says he thinks it would be better to take a photo. I hand him my camera to take pictures, and he takes several from different angles (from the outside). Rosa, who has been drawing outside the house, moves inside to draw. Emita follows her. Rambo Bebé and Natasha Bebé also start drawing in their journals. Emita shows me her drawing, and I ask her how it will help. She tells me that then they will all know how to build it again. I ask if others will understand it. She then labels "tabo" (table), "box", and "box" – the house was partially constructed with a classroom table (Figure 4.8). I then look at Natasha Bebé's drawing. She points and says, "Aquí entra, por la puerta." I ask if others will know where to enter, reminding her how I tried to go inside the wrong way. She draws arrows for the main entrance (Figure 4.9).

The children negotiated how to capture their structure in order to continue it for next time. They negotiated between different forms of visual representation, and also how they would incorporate linguistic and visuals for labels. Emita used English labels, whereas the others used arrows, which can presumably be understood in any language. Over time, the kids stopped drawing maps of their houses. Sometimes I asked if they wanted to draw their house so that they could remember it for next time. A few expressed that it took too much time. Rambo Bebé said once, "Mejor una foto." There were several times the kids asked me to pull up a photo of particular houses they made, to reference as they built a new one.

Figure 4.8: Emita's Drawing of the Casa

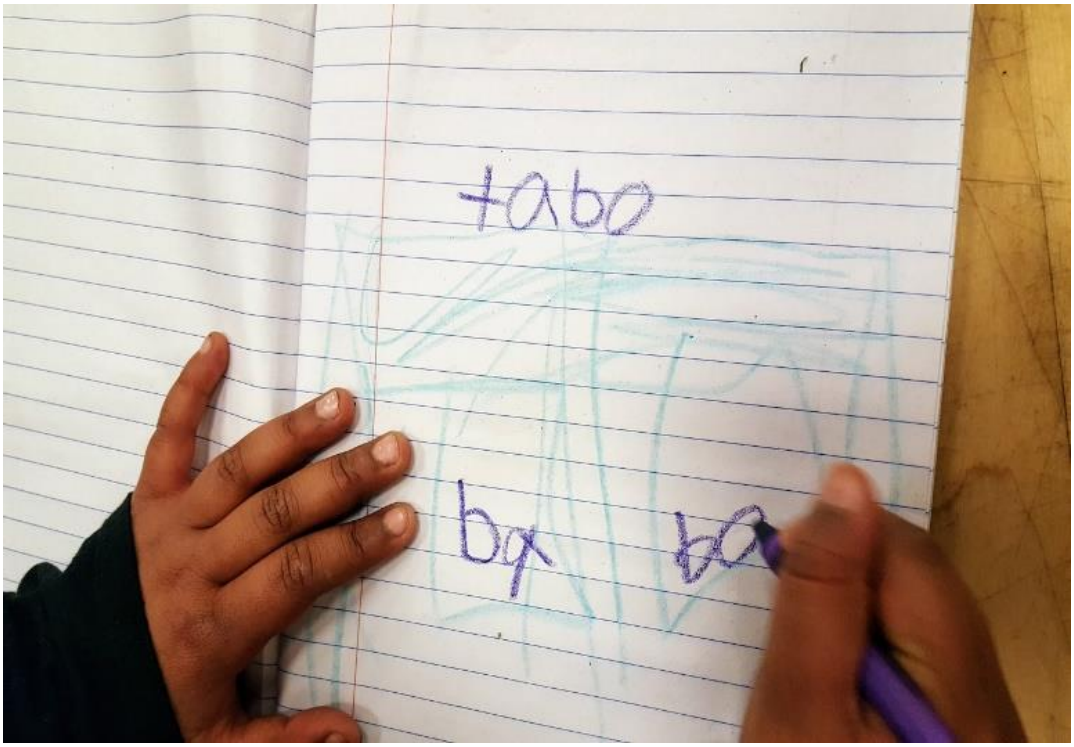
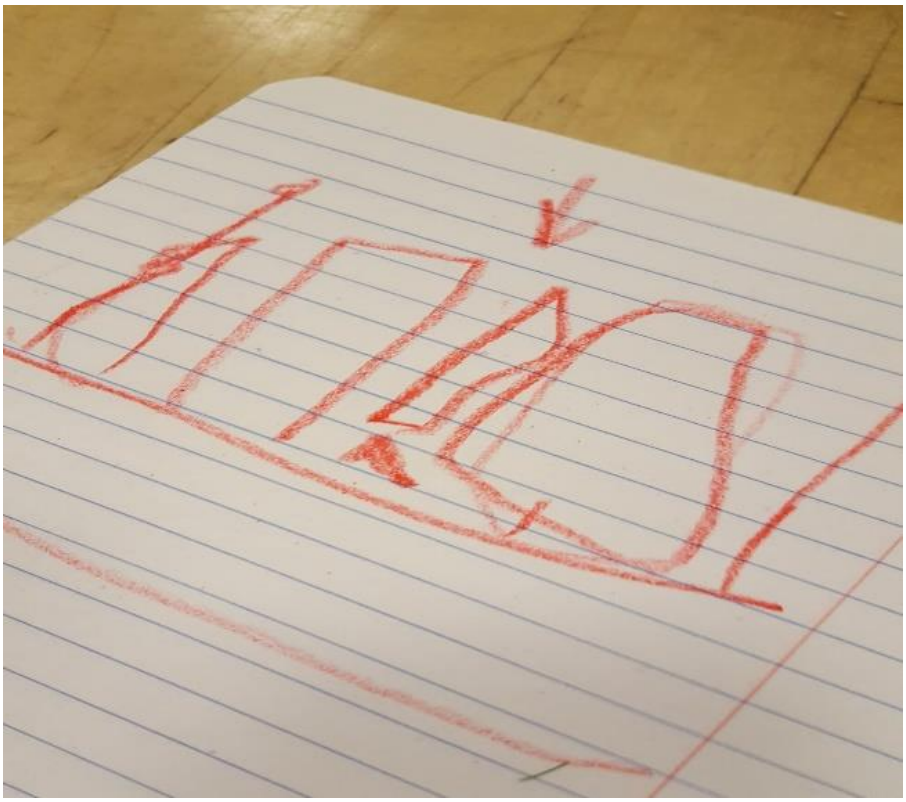


Figure 4.9: Natasha Bebé's Drawing of the Casa



Making Choices about When and How to Collaborate

As the children built their own representations of houses to play with, they often collaborated to construct the cardboard pieces together. This collective work often mirrored what Rogoff et al. (2017) describe as sophisticated collaboration wherein the children were thinking together and "working together in particularly fluid, skilled coordination" (p. 879) as they maneuvered the cardboard and other materials together, fluidly drawing on their literacy, numeracy, and language practices. The children attended to what was happening in the group, thinking about what was needed for their shared goals. Sometimes this included breaking off to attend to another task. While at first glance, it could appear as if the children were simply dividing up tasks, I would argue that when they did do so, it was only as a result of their overall awareness and ability to take initiative when one or more children saw something that needed to be done. This was the case when Natasha Bebé and Rambo Bebé decided to decorate the house while the others built the structure. Another example was when Anthony100 wrote a label for the house in response to their collective problem of older kids breaking it. The others, observing this, later built onto this idea by adding everyone's names onto the house. In other words, the children did not break off alone in isolation – they did so with a collective purpose in mind. Sometimes they communicated about these decisions verbally, while at other times they used non-verbal communication to acknowledge each other's actions and check for agreement.

While based on the collective construction of the house, the maps themselves were always created individually. This may simply be due to the fact that the children had individual journals that were introduced early on. A contrasting example was a case at B-Club two years prior when three kindergartners opted to create a shared map, or blueprint, for their castle structure (Franco, Orellana & Franke, 2019) when journals were not consistently available.

These cases demonstrate how the available materials might impact children's decisions about when and how to collaborate on their representation work.

Shifting and/or Combining Languages and Modes of Representation

When building their casas, the children used the materials and physical arrangement of materials (layout) in conjunction with their written and oral modes of communication as "resources for representation" (Kress & Jewitt, 2003, p. 1). They often used different modes to alter the purpose of the representation (Wohlwend, 2011). For instance, the children decided to use their backpacks to close an open space, turning what was originally an open door into a wall that later had a "No entra" sign attached to it.

Sometimes the children shifted languages as they built their houses to communicate. For example, Rosa, who spoke mostly Spanish during her play, most often spoke to Emita directly in English, the language Emita was most comfortable with. Rosa would then revert to Spanish when she spoke to someone else or the group. Natasha Bebé also used English when she spoke to Cammy, who did not understand much Spanish. Other times, within the group the children listened to others speaking one language then responded in another, usually the language the particular child was most comfortable using. For example, Rosa and Rambo Bebé both named their family roles in Spanish. Rosa said that she was the mami, and Rambo Bebé said, "Yo soy el perro." Emita added, "I want to be a puppy too, and barked. She was joining in the role play and adding on to Rambo Bebé's comment, using English to do so.

The children also made intentional, thoughtful choices about which languages to use in their labels, such as when Natasha Bebé suggested only writing a message in Spanish with the express purpose of excluding non-Spanish readers because the house was already too crowded – using language as a border to keep people out. In making this choice, she was drawing from her

multilingual and spatial understandings. Other times children chose to use drawings instead of words to create their labels. For example, Natasha Bebé and Rambo Bebé drew arrows on their maps, symbols that can be understood by speakers of different languages.

Superheroes!

At B-Club, some of the children created costumes to become superheroes and other characters. Ben10 was particularly interested in this activity and often decided at the beginning of the B-Club day what he wanted to be. Sometimes he expressed this to me beforehand during the school day. He would often say, "Today I want to be…" then decided on a particular superhero (like Captain America), a combination of superheroes, or something that wouldn't typically fall into that category at all, such as a banana or lobster. Ben10 sometimes planned this out with his friend Jeffy and occasionally Anthony100. Most often he enlisted Jasmine to participate in his play on the day she was there, sharing his ideas and asking for her to help him execute his plans; other times he asked me or the other graduate student researchers and/or undergrads to help. Other children joined in for portions of the play, creating their own costumes. Sometimes this blended into the Houses & Casas activity and the superheroes played in the houses. Below I describe the first day Ben10 became a superhero and meshed two known superheroes into one: "SpidermanWolverine."

Becoming SpidermanWolverine

Ben10 had been building a cardboard house with Jeffy and Anthony100 when he started taping scraps of cardboard to his arm. He asked Jasmine to draw a cell phone on it so he could call people. Jeffy asked for one too. Ben10 then found a piece of cardboard to put inside of his "phone watch." Ben10 explained that it wasn't a gun – rather, the things he aimed at turned the color blue. Next, Ben10 and Jasmine created a "star shield" together. Ben10 noticed there was

some cardboard leftover from making the shield and had the idea to make the two pieces into a belt to hold his "weapons." Ben10 worked with Jasmine and Lilia to figure out how to create the belt.

> Ben10 suggests using tape for the belt. Jasmine and Ben10 start trying to use the tape when Lilia suggests using some ribbon or string from the supply closet to help tie it around Ben10's waist. Lilia comes back with the string and they wonder how to attach it to the two pieces of cardboard. Ben10 borrows Lilia's pen and attempts to poke holes in the cardboard, but finds that the cardboard is very thick. Jasmine picks up a pair of scissors to add some holes. Ben10 holds the two parts of his 'belt' on the two sides of his waist while Jasmine threads the string through the holes and ties it around his waist. Jasmine asks if she can take a picture of him. Ben10 holds the shield up and puts one arm on his waist to pose. Then he wants to put his shield in his backpack to save to take home. Next Ben10 notices some more cardboard scraps on the floor. Jasmine asks what he wants to do with them, and he responds that he wants to put them on his fingers, like claws. They color them with a green marker, and Ben10 tells Jasmine which one he wants on each finger. He then says he want to put them in his backpack.

Ben10, Jasmine, and Lilia discussed how to put materials together in order to create Ben10's superhero costume. They tried different approaches and thought together about what worked best based on his communicated preferences. Once they completed each piece of the costume, Ben10 immediately put it in his backpack to take home.

> Lilia and Jasmine ask Ben10 what his superhero name is, and he responds, "SpidermanWolverine," clarifying that it's one word. Lilia then asks Ben10 about his superhero powers, and he tells her helping the world and people. Lilia then discreetly passes Jasmine a note that says, "Secret Mission — ¡misión secreta!" on the outside, and inside, "Mr. SpidermanWolverine, we need your help! Can you help us? – The World." Jasmine asks what the note says. Ben10, Jeffy, and another boy look at a piece of paper, and Jeffy yells, "You have a secret mission!" Anthony100 runs up to me and asks if I can tie his shoelace. I tell him Ben10 and Jeffy are going to save the planet, and I ask if he wants to help. Anthony100 tells me, "I already saved the planet," and runs off. Lilia tells Ben10 that Ricky, a fifth-grader, is from a "super-secret service." Ben10 shows me the note and says, "This is really cool. My mom is going to read it." Lilia asks if his mom is a superhero too. "Yeah," he responds. I ask if she has powers. "Yeah. Long nails." He shows

his claws. Jasmine asks if that's why he wanted the claws. Ben10 nods.

Ben10 showed excitement about the secret mission and wanting to share it with his mom. He continues to discuss the secret mission with Jasmine:

Jasmine: How are we going to save the world?
Janelle: What do you have to do for your secret mission?
Ben10: A comic book. A superhero comic book.
Jasmine: We could follow the comic books?
Ben10: (Nods).
Jasmine: What comic books have you read before?
Ben10: We're going to make it.
Jasmine: That's how we're going to figure out the secret mission?

Next Ben10 asked for paper in order to create his comic book. Lilia offered her notebook, but he wanted his own separate piece of paper. I brought out two from the storage closet. Ben10 sat down with Jasmine and told her she should do one too. He showed her how to fold it, then he started writing. Jasmine then asked what he wrote, and Ben10 again mentioned his mom reading his comic book.

> Ben10 says that his mom is going to read his comic book when she gets home. I ask if she's going to read it in English or Spanish, holding up the paper. He says, "Spanish," then glances again at the paper and says, "English. My mom can talk Español. ¿Do you know how to talk Español?" he asks, looking at me. "Do I?" I pause. "¿Sí, y tú?" Jasmine then asks if he is writing out the secret mission and what the secret mission is trying to say. He says, "Inglés." She asks him to read what he wrote (he had written "WVARAeee.") Ben10 nods and starts drawing, then points at his drawing: "The world."

When Jasmine asked Ben10 about writing out the secret mission, he responded, "Inglés," which seems to be a metalinguistic move, being aware of what language he was writing in during that time. Similarly, when I asked about his mom reading in English or Spanish, Ben10 first says his mom will read it in Spanish, then says English. His mom is most comfortable speaking Spanish but often listens to English and understands it (this was communicated to me by Ben10,

his sister, and his mom). It's possible that Ben10 was negotiating that idea, thinking about his mom reading his English writing but thinking or talking about it in Spanish. It's also possible that he associated Spanish, more generally, with his mom.

When Jasmine asked him what he wrote, rather than responding with words, he began to draw what he had written – "the world."

Ben10: (Writes another word).
Jasmine: What does it say?
Ben10: "Planet Earth."
Jasmine: What are we doing with Planet Earth?
Ben10: All around the world. I'm going to draw the person right here (he points to the other side of the paper).
Jasmine: So, you?
Ben10: Yeah (he smiles). Can you help me draw?
Jasmine: What are you trying to draw? You want me to draw with you?

Ben10 starts drawing circles, one for the head and one for the body. Ben10 says he wants a Spiderman face, pointing to the face and to the circle he already drew on his paper. He asks to see Spiderman. Jasmine takes out her phone and pulls up a photo. She tilts it so he can see and copy it onto his own paper. He draws, glancing back and forth from the phone to his paper (Figure 4.10). He says he wants Wolverine also because he's "SpidermanWolverine." He starts drawing more. He looks at the cartoon version of Wolverine and the live action movie version. Jasmine points to his drawing and asks, "That's how you look?" He nods yes and asks to see the legs also.

Ben10 drew from multiple representations of two different superheroes to create his own version. He incorporated some ideas from memory and others from the photos. Eventually Jasmine asked if he was done drawing so she could take a photo. He told her, "You have to put the words like that," as he adjusted the paper. "Like this?" she asked him. Ben10 wanted to make sure she took the photo with the words facing the correct way, orienting it in a way that could be read. I asked if I could take a photo, and he turned it toward me. Ben10 and Jeffy said that they were going to save the world by solving the secret mission.

Before cleaning up, I asked Ben10 if he wanted us to keep the secret mission here so he could continue it next time or if he wanted to take it home. He said he wanted to take it home. Jasmine reminded him to be sure it bring it back next week so we could continue to save the world. Ben10 didn't end up bringing it back, but he told me that we had photos of his drawing so we didn't need it there anymore.

Figure 4.10: Drawing SpidermanWolverine

Making Choices about When and How to Collaborate

Unlike the Acorn and Homes & Casas activities, many of the interactions in Superheroes! involved only one child and multiple adults. This could be due to the fact that Ben10 often had an individual (versus collective) vision for the activity, or simply that fewer children wanted to be involved (e.g., Anthony100 stating that he had already saved the world that day). Regardless, that fewer children were involved impacted the types of collaboration Ben10 engaged in during his play. The adults (including myself) generally took on the roles of asking questions and letting Ben10 decide on the goal and purpose. Ben10 often enlisted others to help him, especially after

trying something out himself first (i.e., cutting the cardboard or writing out a word.) Ben10 also often built on others' ideas when suggestions were made about how to make costumes.

Shifting and/or Combining Languages & Modes of Representation

Ben10 drew from a variety of representations of superheroes in order to create his own version of one, in this case, SpidermanWolverine. Consistent with his choices in other activities, he preferred to take photos to document and capture his play in order to continue it at future B-Club meetings. This also enabled him to bring the originals home to show his mom and continue to play with what he had created.

When reading and writing his comic book, Ben10 shifted to use some Spanish, which he did not do often. As mentioned, it's possible this shift was due to his awareness of his mom's language practices, especially because she mostly speaks Spanish. It's also possible that he was anticipating how she would read what he wrote. Additionally, he used different modes of communication to both create his representations and to address specific questions. For example, when Jasmine asked him what he wrote, instead of saying it aloud, he first drew a picture of the world, then responded linguistically afterwards. He used his drawing as a way to clarify and respond to the question.

Language Demands

Language varies greatly in how it is used in different contexts for different purposes (Fang, Schleppegrell, & Cox, 2006). *Academic language* is defined as the "oral and written language used for academic purposes" (Stanford Center for Assessment, Learning, & Equity [SCALE], 2018). This often encompasses language forms that differ from the everyday ways of communicating, making academic language in schools unfamiliar for many students, regardless of the particular language(s) they speak (Gibbons, 2009). In the context of schools, the term

language demands refers to what students need to able to do with language in order to carry out academic tasks and be successful in school (Fang, 2006).

Poza (2018) highlights that children not only face language demands in their schooling, but also experience many restrictions in how they are able to use their language as they engage in classroom tasks. A restriction that many bilingual and multilingual students frequently face in school is being limited to a single language rather than being able to draw openly from their full linguistic repertoire. As mentioned, even in bilingual classrooms, students are often restricted to one language or the other, approaching bilingualism from a monolingual norm (García, 2009; Grosjean, 1989).

In this section, I discuss some of the ways the children at B-Club used translanguaging skills in their play as they negotiated decisions about their representations and carried out tasks that paralleled the academic language demands they are faced with for both literacy and numeracy related-tasks in schools. In order to demonstrate this parallel, I highlight examples of *language functions* (the purpose of the language use, i.e., to inform, compare, analyze, etc.) and *language forms* (specific ways in which syntax, discourse, and vocabulary are used through reading, writing, listening, and/or speaking) for each of the activities – Acorns, Houses & Casas, Superheroes! – and for negotiations surrounding representations of all three activities.

Acorns

Through exploratory language in the Acorns activity, the children used multiple forms of language to *describe* the size, location, and features of the acorns. The quantity was often described as "mucho" or "a lot." Many of the children also used gestures in conjunction with words to describe the orientation or the location of the acorns (motioning and pointing as they said "aca" and "allí" or "there" to direct the group to more acorns). Natasha Bebé used a

metaphor ("looks like eyes") to describe the holes she found in the acorn, then later represented this comparison in her drawing. Children also used their multilingual repertoire to *compare* the size and quantity of acorns. They communicated that one was a "bigger acorn," or there were "a lot," and/or "mucho," using informal math language. There were also cases of visual comparisons – for instance when Anthony100 drew concentric circles to compare the sizes of the acorns. One of Rosa's comparisons revealed knowledge about adjectives in Spanish when she said, "Son baby, son babies acorns." She said "baby," a word in English, then paused to think about how she could match the adjective to the noun quantity, an important grammatical rule in Spanish – wherein she would have said "allotas bebés." Another day Rosa also *classified* the acorns by physically placing them into her own defined categories: "'Gordo,' 'grande,' 'mediano,' y 'baby.'"

Houses & Casas

When using the maps and drawings of their house to recount what they had built, the children sometimes *sequenced* their actions by communicating in past tense, often using English and Spanish and/or both. Some examples were "first we covered the table with yoga mats" or "después, the box," pointing to the drawing of the box. Children used drawings, symbols, and labels to *explain* their actions to others, which demonstrates important literacy and numeracy knowledge. Other times the children *summarized* their actions for others. Since Emita often left early, other children would summarize what they did after she left the next time they saw her in B-Club or the classroom. Often they combined oral explanations (in English) with drawings and photos in order to highlight the important ideas from their play.

Superheroes!

In the Superheroes! activity, Ben10 engaged in the genre of stories both by reading the secret mission that was written for him and by creating an extension of that story himself. Ben10, while interacting with others, created a character following a storyline to *entertain*. Ben10's play and representations were part of what Wohlwend (2011) describes as a "live-action text among multiple players that invests materials with pretended meanings and slips the constraints of here-and-now realities" (p. 3). Ben10 built on the initial plot of the secret mission by *creating* his character SpidermanWolverine, then *performing* this "literate identity" in a pretend space (Wohlwend, 2011). He stepped out of the story to further develop the plot, and to also consider his audience and how his representation would be understood by others. For example, he considered in which language his mom would read the secret mission and thus adjusted the orientation of his comic book in order for Jasmine and me to take photos. In the context of stories, these moves all supported his ability to entertain others as Ben10 ensured that his audience would be able to understand the story.

Negotiating Decisions about Representation across Activities

The children also used language for a number of purposes as they negotiated decisions about their representations. For instance, they *evaluated* how to document the quantity or features of the acorns (i.e., taking a photo versus drawing a picture). When they *discussed* different options, often adding on to others' responses or questioning others' reasoning, the children sometimes *justified* their ideas by using supporting evidence to make a claim or suggesting possibilities. For example, when Natasha Bebé wrote, "Si quieres entrar póngase tu nombre abajo" to *inform* others to write their name if they wanted to go inside, she justified (to me and Rambo Bebé, who suggested writing it in English) writing only in Spanish so that fewer

people would enter because not everyone spoke Spanish. These are just a select few examples, but all illustrate how the act of making decisions about representation lead children to situations that address many different kinds of language demands.

Mediating Impact of B-Club

The "community learner" approach at B-Club, along with the program's focus on following children's interests, creates a particular playful learning space for these children. This environment allows for varied types of participation, giving agency to children to bring in their own ideas and question ideas of others. Colegrove & Adair (2014) state that research demonstrates that when Latinx children are given opportunities to be agentic in their learning, they "initiate and design projects, develop questions, give and receive feedback, negotiate, and actively engage in dialogue" (p. 132). At B-Club, my kindergarten collaborators drew on their multilingual resources to do all of these things, using literacy and numeracy practices to represent their ideas through their play. As they played in a space cultivated for a collaborative zone of proximal development (Martin-Beltran, et al., 2017), the children negotiated meaning with one another and/or older children and adults through clarifying questions, adding on to others' ideas, confirming meaning, and adjusting to what had been said in their activities (Gibbons, 2009). Martin-Beltran and colleagues (2017) discuss how teachers can create a collective zone of proximal development to recognize and value translanguaging, and other kinds of participation, to expand learning opportunities for children from varied language backgrounds.

Additionally, the logistics of the B-Club program and its physical space also impacted the children's engagement and representation. They shifted their use and choices over time to adapt to what they learned previously and in response to the logistical conditions of B-Club. For example, initially the children used maps to generate ideas or plan what they would build. Over

time, they articulated that they didn't have enough time to plan first and then build before clean-up. They sometimes drew maps after completing their houses so they could remember how to build them again; however, the same materials were not always available the next time, and the children were not always able to identify the exact needed materials from their drawings. Eventually, they stopped creating maps and asked to take photos instead which was faster and better identified the materials they used. These were decisions they worked out after trying different approaches of representation to support and continue their play in this particular space.

Conclusion

Much of the discussion and collaboration between the children came out of their need to make decisions about representations for their own defined goals and purposes. Most often in school the particular goals and purposes of a lesson are defined *for* the children, by their teachers, the curriculum, or the administration. Children are normally told when they are to work individually and when and how they are to collaborate; they are expected to follow instructions about how to use or create representations in school. If they do have choices, they tend to be standardized with "strict limits on how to use them" (Adair, 2014). However, children learn from having to navigate these decisions, discovering when and how to represent ideas, when and how to work together (or not), and how to get support when they need it. Mercer and Littleton (2007) explain this as people learn from a "combination of observing experts at work, receiving some guidance from them and trying out the tools for themselves" (p. 14). In the case of B-Club, the kindergartners were able to use their linguistic and numeric tools to try out different kinds of representations for different purposes, while observing other children and adults, and receiving guidance from peers and adults, then ultimately making and evaluating their own choices.

Children, just like adults, benefit from being able to learn to do things in more than one way, which in turn expands their repertoires of practice (Gutierrez & Rogoff, 2003).

CHAPTER 5: CHILDREN POSITIONING THEMSELVES IN THEIR MULTILINGUAL AND GEOMETRIC WORLDS: USING SPATIAL UNDERSTANDING & TRANSLANGUAGING IN REPRESENTATIONS

> Geometry is grasping space. And since it is about the education of children, it is grasping that space in which the child lives, breathes, and moves. The space that the child must learn to know, explore, and conquer, in order to live, breath and move better in.
>
> *– Hans Freudenthal*

> It is translanguaging itself that enables us to make sense of the multilingual worlds we live in.
>
> *– Ofelia Garcia*

> Spatial understandings are necessary for interpreting, understanding, and appreciating our inherently geometric world.
>
> *– 1989 NCTM Curriculum & Evaluation Standards for School Mathematics*

A map made by Rambo Bebé (Figure 5.1) illustrates how children position themselves in their multilingual and geometric worlds. Unlike many traditional maps which are inherently decontextualized, created for broad use, and/or not from the perspective of a single agent, Rambo Bebé's map included a drawing of herself within her community map after her class's field trip around the B-Club's community. Similarly, many of the representations the children drew during B-Club activities included drawings of themselves. Interactions with these drawings often prompted discussions about their perspective and awareness of audience. In this chapter, I explore how the kindergarteners used spatial understanding and translanguaging in their maps and drawings to represent themselves in their play and community.

Figure 5.1 – Rambo Bebé's Community Map

I begin the chapter by discussing the importance of spatial reasoning and translanguaging for young children's linguistic and numeric understanding, as well as the relationship between the two. I then revisit episodes from the Acorns and Houses & Casas activities of the previous chapter to highlight how some of the children drew themselves and others in their representations of those activities, and detail how interactions with these maps and drawings sometimes prompted discussions about mathematical perspectives and awareness of audience. In doing so, I also draw insights from some of the children's representations from the aforementioned class community walk field trip and a community photo activity in B-Club. I end the chapter with a discussion of how the children drew from their spatial and linguistic resources and the significance of these kinds of representations in relation to literacy and numeracy.

Spatial Abilities & Translanguaging

The children used translanguaging practices to understand and communicate across different contexts and spaces (Vogel & Garcia, 2017) as they created representations in their play. Translanguaging highlights the practices children, like the kindergartners in B-Club,

engage in to make sense of their multilingual worlds (Gort, 2012). Spatial understanding is also fundamental to interpreting the world around us (National Council of Teachers of Mathematics [NCTM], 1989). According to the NCTM, spatial relationships and structures should be explored as children use their understandings to describe, represent and navigate their environments. This includes knowing how to represent ideas, when and how to do so, and how to connect spatial and linguistic knowledge – which this study's collaborators demonstrated through Acorns, Houses & Casas, and Superheroes!.

Spatial orientation and *spatial visualization* are important aspects of *spatial understanding*. Clements (1999) defines spatial orientation as "knowing where you are and how to get around in the world, understanding the relationships between different positions in space, especially with respect to your own position" (p. 72). Spatial orientation, as Clements (1999) describes it, requires the ability to connect abstract and concrete meanings; to consider perspectives and viewpoints. Spatial visualization involves understanding and performing imagined movements, creating a mental image and manipulating it (Clements, 1999). Young children's spatial understanding and representation of the space around them is essential for their early learning of mathematics (Freudenthal, 1973) as well as literacy (Kress, 1997).

The spatial concept of understanding one's own position in relationship to different positions in space parallels the way children (and adults) attend to their own position in relation to their environment as they draw on elements of their linguistic repertoires for different purposes (Vogel & Garcia, 2017). In both cases, children need to be aware of their own position in relation to their context. In fact, results from one study showed a relationship between translanguaging competencies and complex spatial reasoning. Greenberg, Bellana, and Bialystok (2013) demonstrated that bilingual children were more accurate than their monolingual peers in

spatial perspective-taking tasks,[17] showing selective attention to relevant perceptual information. The heightened sense of audience and context demonstrated by the bilingual children in this study, although not labeled as such by the authors, is a translanguaging practice.

Some of the B-Club children's spatial work and problem-solving skills were detailed in the previous chapter. In the following sections, I focus on episodes from the Acorn and Casas & Houses activities. I bring up these episodes not to detail all the language and spatial practices that occurred in those activities, but to highlight the ways in which the children leveraged their spatial and linguistic resources to draw themselves in their maps and drawings. The interactions surrounding these representations reveal how children used translanguaging and spatial understandings together to position themselves within these activities.

Collection Drawings: Acorn Activity

In the previous chapter, I detailed how the children represented their acorn collection in a variety of ways. Three of the children, Anthony100, Rambo Bebé, and Natasha Bebé, drew pictures of their acorn collections in their journals. While Rambo Bebé drew tallies to represent the number of acorns she had in her pile, Anthony100 and Natasha Bebé drew the actual acorns, and both included drawings of themselves in their representations.

> Anthony100 draws five acorns in his journal, with one small one inside of a larger one. He also writes the word "Acn" at the top of the page to label his acorn drawing, which is above the picture of himself (Figure 4.2, p. 70). When I ask him to explain his drawing, he points to the figure and says, "This is me looking down at the acorns." He explains that he had different sizes of acorns and counted them. I ask him why he wanted to draw a picture of them, and he tells me, "to remember them and show my mom."

[17] Greenberg et al. (2013) demonstrated that bilingual children were more accurate than their monolingual peers in calculating the observer's view across different positions. The spatial perspective-taking task "involves complex relations between a layout of constant physical objects and arbitrary viewpoints that are continuously changing. The ability to accurately compute these complex relations for a specific vantage point requires a higher-level problem-solving ability and, moreover, one that is fundamental to success in an academic environment" (p. 8).

Anthony100's drawing of himself suggested that he viewed himself as an important part of the Acorn activity; he did not simply view the acorns in isolation. He was thinking about the activity of collecting acorns in relation to his own perspective, documenting his position as a part of the larger activity. His representation led him to describe spatial relations, using spatial language to position himself in relation to the acorns, being above them and looking down. This was true for the time period he was collecting them in the upper field, as well as when he was drawing them the following week. Anthony100 documented this understanding simultaneously for himself and for his mom, which means that he was thinking about multiple audiences. While his label seemed to be written in English, the children used the term "acorns" in both English and Spanish (i.e., "los acorns"). Since I did not ask Anthony100 about this at the time, I am unsure whether he viewed his label being written in English or Spanish.

In a follow up meeting, months later, I showed Anthony100 his journal and asked him about his acorn drawing:

> I turn to the journal page with Anthony100's drawing of himself and the acorns and remind him that he had wanted to show his mom. Knowing that he might not remember what his actual intentions were at the time, I point to the label "Acn" and ask what language he wrote it in. He tells me he doesn't remember but he probably helped his mom by telling her in Spanish (translating it) because he does that a lot.

This was consistent with my conversation with Anthony100's mom who told me he was very proud of being able to help her with translations.

Similar to Anthony100, in one of the pages of her journal Natasha Bebé drew herself with the acorns she collected.

> Natasha Bebé holds her journal near me and says "los hoyos" as she points to the two acorns. These are the two acorns she found with holes in them, which she thought looked like eyes and described as "los ojos." She also includes a sun and a cloud in her drawing. Rambo Bebé, who is standing next to her, asks which

> acorns she drew. Natasha Bebé explains that the drawing is of herself finding the acorns with "los ojos." She adds that everyone else (presumably the other four children and myself) are finding other acorns "allá," pointing off the page.

Just like Anthony100's drawing, Natasha Bebé's drawing suggests that she viewed herself as a central part of the acorn collection activity. Specifically, she was highlighting herself in relation to the two acorns that had captured her attention. In her explanation, she communicated that she was thinking about the activity in terms of the original collection, located outside on the upper field. She not only included herself in that context, but also the sun and cloud, showing the location of the activity and the environment. Additionally, she explained that the other people involved in the activity, i.e. those who were gathering other acorns, were outside of the frame of this particular representation.

Discussions of Mathematical Perspectives & Awareness of Audience

Anthony100 and Natasha Bebé's representations of the acorn collection prompted discussions relating to mathematical perspective and awareness of audience. In the case of Anthony100's drawing, this occurred when I looked at his journal and asked him questions about his drawing. My questions led Anthony100 to explain, using spatial language, that he was looking down at the acorns. He used gestures to point to himself and slid his finger down to the acorns corresponding to his explanation. My questions also led him to explain that he had multiple audiences in mind for this representation – both himself and his mom. For Natasha Bebé's representation, it was Rambo Bebé who prompted this discussion. Rambo Bebé looked at her sister's drawing and asked which acorns she had drawn. In response, Natasha Bebé described the location of the acorns, pointing in the direction of the upper field. She explained the viewpoint from which she created the drawing, which included herself and the acorns, and was able to connect that viewpoint with those of her audience, demonstrating an awareness of

different perspectives within the same space. Natasha Bebé used gesture in conjunction with her verbal response of "allá" to show that the other people were outside of the frame of her drawing. In her explanation, she was attentive to her own perspective of the activity while also considering the other people involved and their physical locations. Even though she focused her attention on a particular moment of a personal event, she still was attentive to the others involved in the activity and communicated that awareness spatially.

Other Collection Drawings

Rambo Bebé had also drawn a representation of the Acorn activity in her journal though it did not include a drawing of herself nor did it lead to any discussions of mathematical perspective or awareness of audience (to my knowledge). One difference between Rambo Bebé's drawing and those of of Anthony100 and Natasha Bebé, was that she drew a more decontextualized representation of the acorns (tallies) vis-à-vis that the other children drew the physical acorns. Rambo Bebé's representation appeared to be more similar to the typical representations of collections I observed in their classroom wherein the focus was generally on counting the quantity of items rather than attempting to reproduce the actual physical appearance of the items. In the classroom it was common for the children to represent collection item(s) with tallies or circles. In these cases, I did not observe any drawings of the children themselves. The word problems I observed children solving were often built around scenarios that included students from the class doing activities that they would encounter in their real lives, making them more contextualized than typical scripted curriculum word problems. These observations helped illuminate how the acorn collection activity differed from many collection activities in which the purposes of the representations were defined by an adult or set up by the premise of the word

problem. With the acorns, the purpose of the representations – and even the inspiration to *create those representations in the first place* – came from the children themselves.

Maps: Casas & Houses Activity

In Chapter 4 I described instances when the children drew maps of their houses. In some cases the children did this before beginning to build their houses in order to brainstorm ideas and/or create plans they could follow in their building. Other times they drew maps after building the house in order to document it and remember how to build it again. Some of the children included drawings of themselves in these maps.

Rambo Bebé began drawing her map while inside the house, then completed it while sitting outside. Rosa, who also drew her own map, drew herself and Rambo Bebé at a point in time when they were in the same room, whereas Rambo Bebé drew her sister and herself in different rooms, partitioned by a window:

> Rosa looks at Rambo Bebé's map and asks who the people are. Rambo Bebé points to the person in the larger space and explains that it's herself, "soy yo," and that the other person is Rosa (Figure 5.2). Rosa smiles, then picks up her own journal to show her map (Figure 5.3). Rosa points to the figures she drew and explains that in hers the two of them are together in the same room: "Estamos en la sala juntas." Rambo Bebé explains that in order to draw the inside portion of the house, she went back inside to draw the two different rooms (when she and Rosa were on different sides of the window that Emita had made). I ask the girls if they can explain more about their maps. Rambo Bebé tells me that the outside line of her drawing is the outside wall of the house.

In both cases, Rambo Bebé and Rosa represented themselves in the Casas & Houses activity in relation to their physical position within the house, and with each other at a fixed point in time.

Figure 5.2: Rambo Bebé's Map

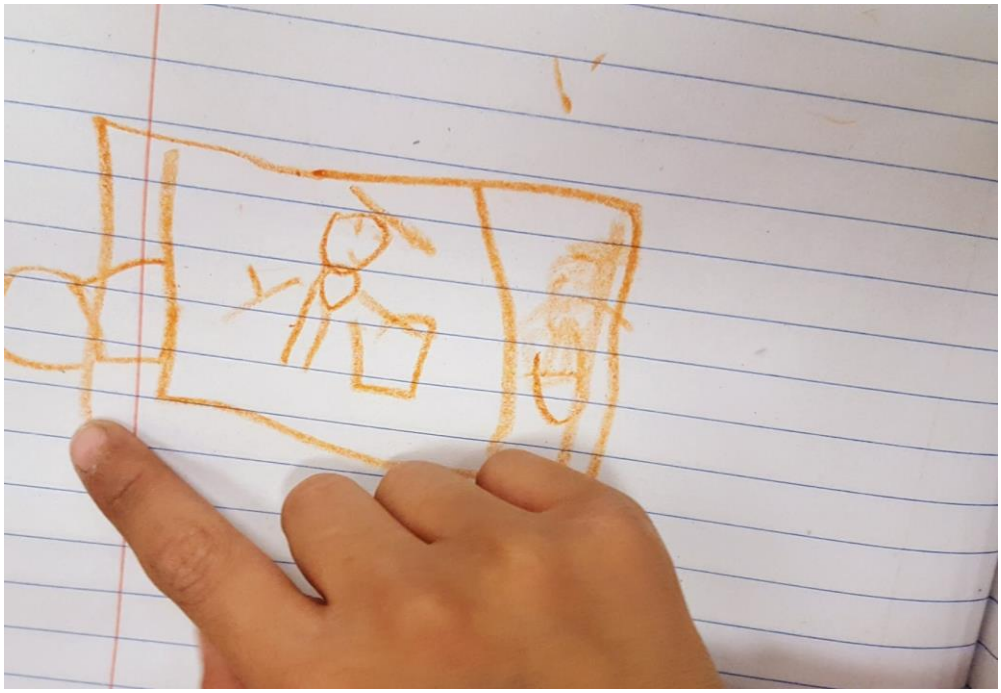
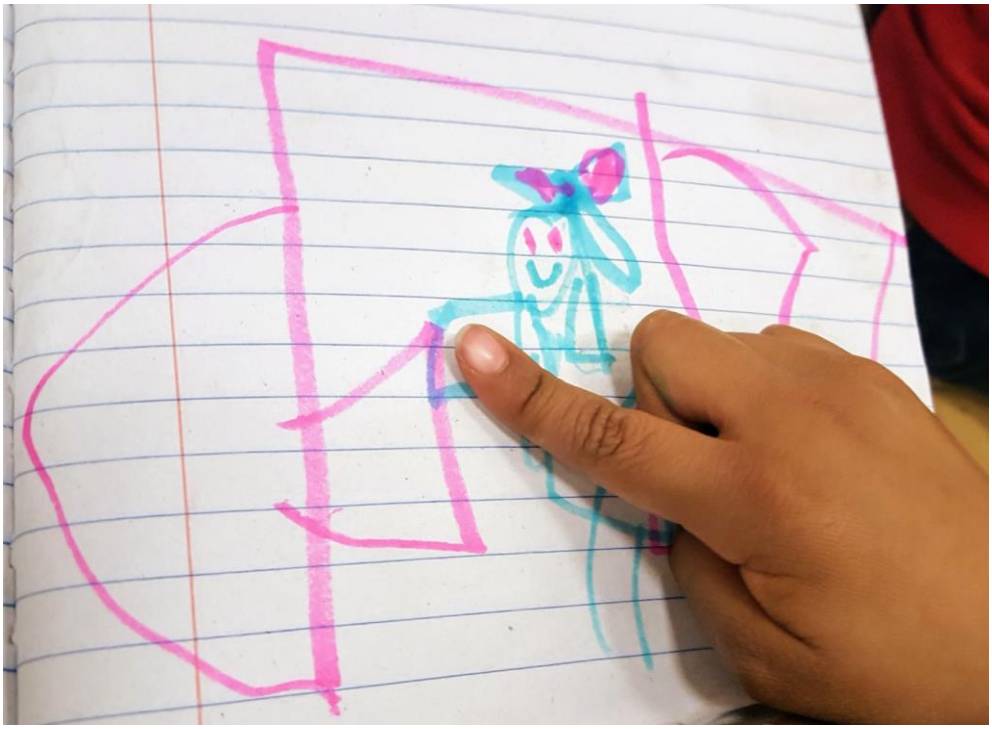


Figure 5.3: Rosa's Map

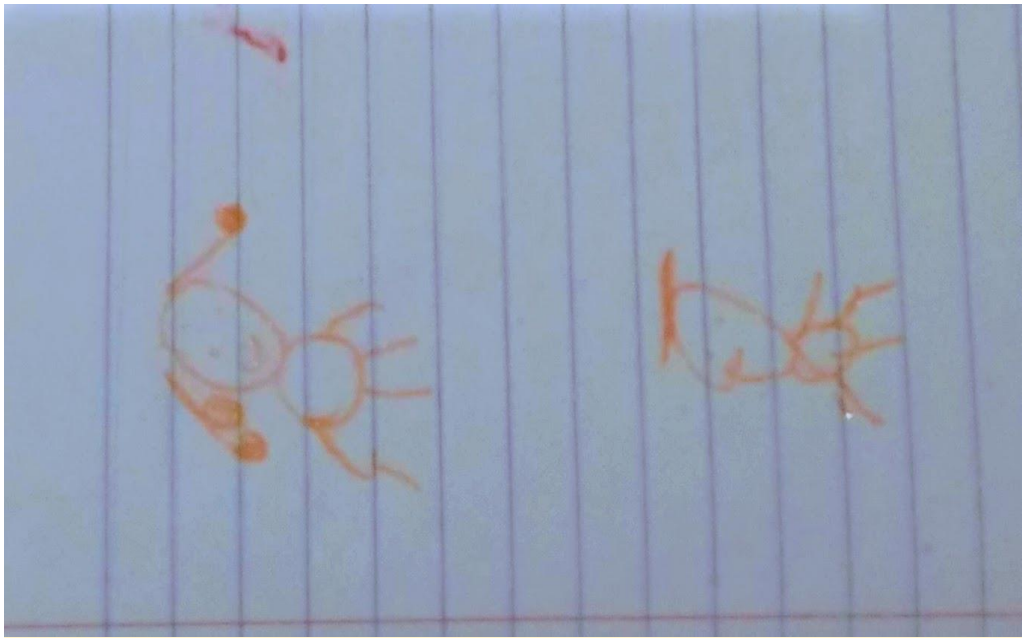


On that same day, Anthony100 had also drawn himself and Emita in his journal, though he did not end up completing the map of the house before we cleaned up:

> Anthony100 begins by drawing two people before drawing the actual house (Figure 5.4). When I ask him about the drawing, he tells me that he drew himself and Emita inside the house, from when they were both inside together. He then explains that he started looking at Ben10's drawings, which is why he didn't finish drawing his own house. I ask Anthony100 where he and Emita were located within the house. He looks down at his journal then over to the actual house structure. He then turns his journal 90° to match the orientation of the drawing to that of the house and points to what part of the house he was in and what part Emita was in, as he tells me "allí" and "allí." Emita, who seems to have heard her name mentioned, comes over and says, "I want to see." Anthony100 shows her his map and says, "This is me and this is you. We're inside the house."

Anthony100's decision to begin his map with drawings of himself and Emita showed how centrally he viewed himself and his fellow collaborators in this activity and this space. While he hadn't yet drawn the house, he had already thought about their positions within the house.

Figure 5.4: Anthony100's Map, Turned 90°



Discussions of Mathematical Perspectives & Awareness of Audience

Rosa, Rambo Bebé, and Anthony100's maps of the Casas & Houses activity, which included drawings of themselves, led some of the children to discuss mathematical perspective and audience awareness. Rosa's initial interest in the people included in Rambo Bebé's map led the two of them to use their maps to compare perspectives of both their personal perspectives about the moment of time they decided to capture and the mathematical viewpoints of their respective drawings. They were both aware of their own positions within the house, as well as each other's. Rambo Bebé explained that she went back inside to draw her map from the perspective in which she was positioning herself: inside the "sala" on the other side of Rosa. When I asked Rambo Bebé and Rosa to tell me more about their maps, Rambo Bebé also discussed the outside perspective of the house in that the outline in her house representation showed the outside walls seen from our current position. Similarly, when I asked Anthony100 about his map, he explained his and Emita's position inside the house, even though he had yet to draw the actual house portion of his map. He turned his drawing 90° in order to match their position in relation to the perspective of the structure of the actual house. He pointed and said, "allí" to show the exact location. He shifted to using English in his positioning explanation to Emita, as he pointed and said, "This is me and this is you. We're inside the house."

Anthony100's move to position the representation in relation to the perspective of the house was consistent with how some of the children shifted their maps or photos to demonstrate perspective in the community photos activity, described in the following section. Additionally, I discuss community maps the children drew in their classroom, including the one pictured in the beginning of this chapter.

Other Maps: Community Photos in B-Club & Community Walk Field Trip

In "Mini B-Club," the collaborators and I looked at community photos as an extension of the exploration activity which, in turn, led to the children collecting acorns. When I had asked the children questions about what was outside of the school grounds, Ben10 had suggested bringing in photos so they could see more things. The other children showed interest, so I brought the photos in on two separate occasions. The children seemed excited about photos that captured places meaningful to them (like their school or a nearby store they visited frequently) or if they recognized the places in the photos. Some of the kids started turning the photos of the school and pointing to show which side of the school it was from. For example, Rambo Bebé grabbed a photo of the school and said, "¡Nuestra escuela!" Anthony100 then took the photo and turned it around to face the corresponding front entrance, pointing; he said, "Allí, enfrente." Similarly, Rosa found another photo of the school from another angle, looked down at the field, then adjusted the photo 90° and said, "O sí, allí," Others started explaining where they lived in relation to what was pictured in the photo (Figure 5.5). Rambo Bebé saw a photo of a storefront and told us that she lived near there, explaining to there by going down the street, and pointing down the street as she said, "Yo vivo aquí. Te vas por aquí." Rosa picked up a photo of the 99-cent store and gave directions verbally, with gestures, about how to go from the store to her house: "Más para allá, dar la vuelta y allí está una edificio y allí está mi casa."

Figure 5.5: Explaining Where They Lived in Relation to the Photo

Some of the children drew maps to further explain the relationship between where they lived and the places in the photos. For example, Anthony100 looked at a photo of a laundromat and said he lived near there. He opened his journal and drew a map of how to get from the school to the laundromat then to his house, positioning the photos in relation to one another. He also included a drawing of himself and his mom because they walk to school together (Figure 5.6). Ben10 drew a "mind map" with himself in the center, connected to all of his favorite places around him, some pictured in the photos, such as the grocery store, and others not, such as his house (Figure 5.7). He explained this verbally as he pointed to each place on his map and also pointed in the direction of the actual location of each place in relation to us.

Figure 5.6: Anthony100's Map

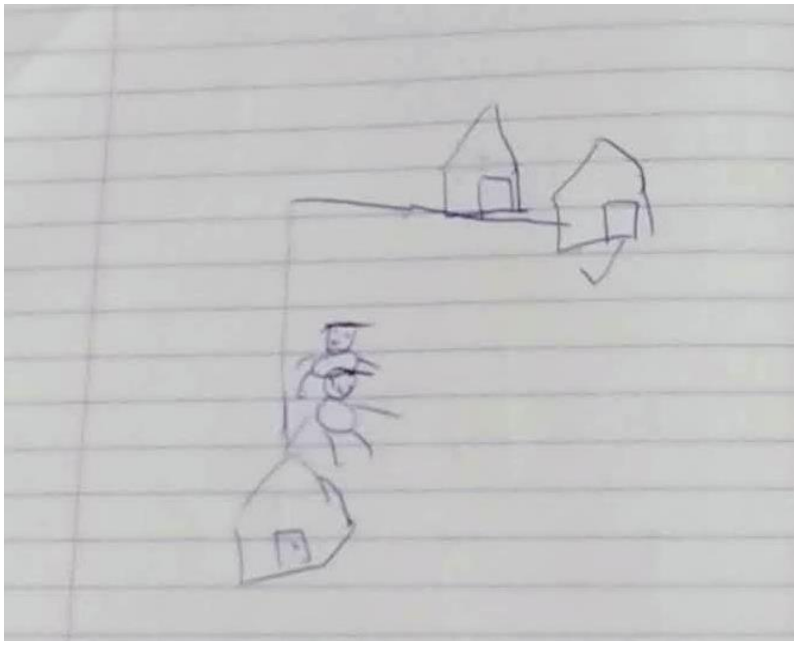
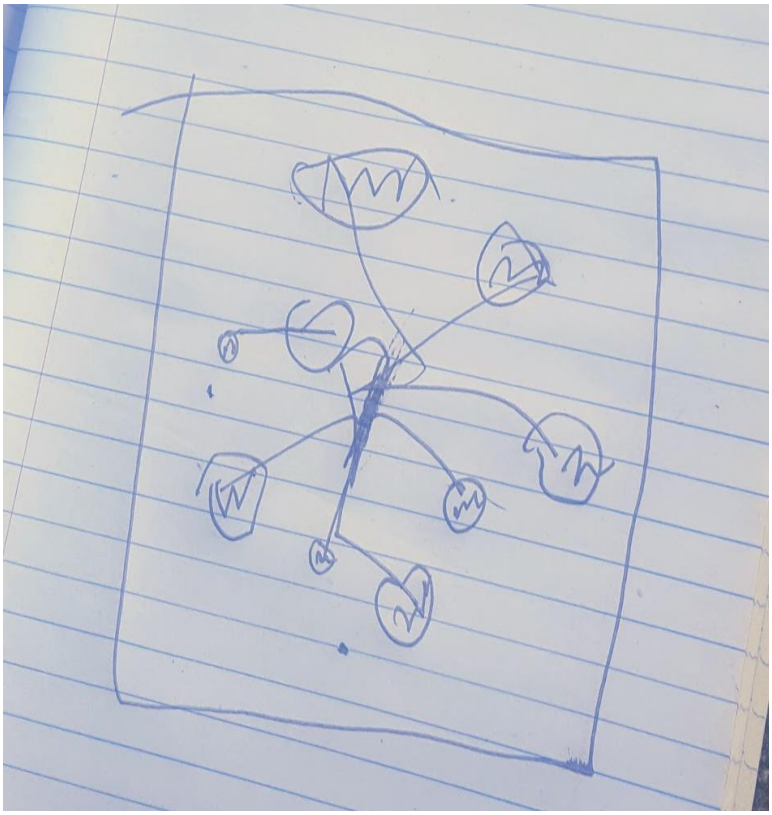


Figure 5.7: Ben10's Map



The ways in which the children shifted the positions of the photos, and sometimes themselves, in relation to the perspective of the school and neighborhood was in line with how Anthony100 repositioned his map of the house (Figure 5.4, p.109). In all of their maps and verbal explanations, the children revealed how they were making sense of these spaces in relation to one another and themselves. They also showed attention to multiple perspectives by discussing different angles and, sometimes, perspectives not shown in the maps or photos. For instance, Rosa talked about the door on the other side of the school building while looking at a photo of one façade of the school. This was similar to how the children described the location of people outside of the frame of their Acorn and Houses & Casas activities representation. In all of these examples, the children utilized spatial language in conjunction with gestures and drawings to explain spatial relations.

As part of a class assignment, the children created community maps after going on a community walk field trip. This field trip was part of their social studies unit called "Our Community." Rambo Bebé's map from the activity (Figure 5.2, p. 108), which included a drawing of herself within her community, included buildings, streets, and cars, with printed labels such as "apartment building," "traffic light," "baker," "park," and "house." Rambo Bebé and Rosa both drew themselves into the scene they presented on the page. When I asked Rambo Bebé to tell me about her map, though her labels were in English, she pointed out everything in Spanish: "Esto es una iglesia, una panadería. Aquí está un arbol. Soy yo. Es una calle." As she moved along telling me about the different buildings, she pointed to herself as well.

When I asked Rosa to explain her community map (Figure 5.8), she first told me that the people were her, her in-class partner, and her partner's dad, who was on the field trip with them. She said that he was smaller because he was standing farther away from them. In line with their

other drawings, these community maps suggest that Rosa and Rambo Bebé viewed themselves as part of their community space. When they were given the task of documenting their community by drawing a map, they approached it from their own perspective and put themselves into their community. Rosa's description of her map showed further understanding of perspective as she explained the positioning of the people, drawing from her spatial and linguistic resources.

Figure 5.8: Rosa's Community Map

Conclusion

Many of the children included drawings of themselves in their maps and collection drawings when they had the opportunity to develop and use their own representations in their play, using their spatial and linguistic resources in relation to one another. This is quite different from how representations are traditionally used in most schooling contexts wherein children tend to have few opportunities to make meaning from their own perspective (Worthington & Carruthers, 2003). Nor do most math activities create opportunities to be part of the mathematics (i.e., the children being the ones to collect the acorns and represent them; the children going on

the community walk before mapping it). In school, children are most often acting on outside direction which impacts what gets represented and can limit opportunities to utilize their spatial and linguistic resources. The B-Club children's drawings of themselves in their maps and collection drawings demonstrate how they see themselves as part of these activities – as *agents* of the collection process, as *occupying* the homes they built, and as *members of* the community they walked – rather than viewing these activities as decontextualized. The children used representations to make sense of their world from their own perspectives and for their own purposes. This is not only an important point for mathematical understanding (Clements, 1999), but also for literacy development. Pérez (2004) says, "A view of literacy from a sociocultural theory of learning considers and seeks to understand the cultural context within which children have grown and developed. It seeks to understand how children interpret who they are in relation to others and how children have learned to process, interpret, and encode their world" (p. 4). It is important for children to be able to make connections between their representations within contexts that are meaningful to them (Worthington & Carruthers, 2003) for both literacy and numeracy. Children use spatial understanding and translanguaging practices to both create and describe spatial relations in ways that educators might not always be able to observe. For instance, if Anthony100 did not draw himself within his representation, we would not have heard his spatial language in describing the drawing because he drew from his translingual understandings to conceive of and communicate a description that included himself. Playful interactions with these maps and drawings prompted discussions surrounding mathematical perspectives and awareness of audience. They also enabled the children to discuss spatial relations while utilizing their spatial and linguistic resources. Through their play, the collaborators in my study used spatial understanding to support their language practices, and

their language practices to support their spatial understanding. This not only gave the children space to work on these practices in relation to each other, but also space to demonstrate those abilities to anyone willing to listen and observe.

CHAPTER 6: DISCUSSION & IMPLICATIONS

> You can discover more about a person in an hour of play than in a year of conversation.
>
> – *Plato*

In this dissertation I demonstrated how children drew from their translingual resources as they created representations in their play. This included (1) the ways children used different linguistic and numeric tools to try out various forms of representation for different purposes and audiences, and (2) how they used spatial understanding and translanguaging in their maps and drawings to represent themselves within their play and community. In this final chapter, I discuss how these findings inform theory in regard to translanguaging, spatial language and understanding, and reframing teacher education. I then end the chapter by addressing implications for policy and practice, discussing how educators can use play as a tool for teaching and learning.

Discussion

Translanguaging

The findings from this study contribute to the literature on translanguaging by shedding light on how children use translanguaging to create representations in their play. The interactions I observed offer insights about how children select features of their linguistic repertoire as they negotiate decisions about representation. This often led the children of my study to make decisions about collaboration and shift and/or combine languages and modes of representation seemingly based on awareness of audience and their own defined purposes. I suggest that the flexibility, attention to others, and ability to blend ideas, which Rogoff and colleagues (2017) describe as "components of sophisticated collaboration," parallel the ways in which children

attend to audiences and use their linguistic tools flexibly and fluidly to make meaning in their representations. The flexible use of linguistic tools and the heightened sense of audience are practices of translanguaging, which can be used as a tool for collective thinking in collaborative work.

More specifically, this study also adds to the relatively small body of research on translanguaging within mathematics by highlighting how children draw on their linguistic features to describe and represent their mathematical thinking, and participate in math-related tasks. The interactions detailed in this study may also suggest connections between children's understandings of the perspectives of others (Orellana & Reynolds, 2008) and their ability to understand various geometric perspectives. Just as Martínez and colleagues (2008) found in the relationship between the skills bilingual students use to translate for their families and those they use to shift voices for different audiences in their writing, the children in my study may be accessing their multilingual awareness (MeloPfeifer, 2015) encompassed by translanguaging as they think about geometric perspectives.

Spatial Understanding

One mathematical concept that was prominent in the data from this study was *spatial understanding*. Spatial understanding is considered to be crucial in early mathematics and literacy, but is understudied and underdeveloped in early childhood education (Francis et al., 2017). The findings from this study demonstrate various ways the collaborators connected their language practices to spatial understandings as they created, used, and described their representations. The children used informal and formal mathematical terms (i.e., "más," "more," "muchos," "juntos," "together," "above") by also incorporating visual, gestural, and spatial modes of representation to communicate as they collaborated in their play.

The ways the children positioned themselves within their maps and drawings shed light on how children can use representations to make sense of their world from their own perspectives and for their own purposes. The children's illustrations of themselves in their maps and drawings suggested an understanding that they viewed themselves as part of their own activities. They used spatial understanding and translanguaging to represent themselves in their play and community. Interactions with these maps and drawings also prompted discussions surrounding mathematical perspectives and awareness of audience, enabling the children to discuss spatial relations while leveraging their spatial and linguistic resources.

I suggest that the spatial reasoning concept of understanding one's own position in relation to other positions in space aligns with the way individuals living in multilingual communities draw from their linguistic repertoires for different purposes and audiences. In both cases, as the children in this study suggested through their representations, individuals are aware of their own position in relation to their context. This supports the findings that bilingual children are more accurate than monolingual children in spatial perspective-taking as they show selective attention to relevant perceptual information (Greenberg et al., 2013). In the following section, I further describe the importance of recognizing the complex spatial language young children use in their play.

The "Word Gap" & Spatial Language

Much of the research and discussion surrounding spatial language follows the discourse of the supposed "Word Gap." The Word Gap argument was first introduced by Hart and Risley's (1995) report that by age three, children from lower socio-economic backgrounds heard thirty million fewer words than did children from higher socio-economic groups. Despite a number of strong critiques of Hart and Risley's work (see Avineri, Johnson, Brice-Heath, McCarty, Ochs,

Kremer-Sadlik, Blum, Zentella, Rosa, Flores, Alim & Paris, 2015; Baugh, 2017; García & Otheguy, 2017; Johnson & Zentella, 2017; Miller & Sperry, 2012), scholars, policy-makers, educators, and the media have taken up this deficit framing, which places the blame on families and parents rather than addressing the larger societal inequities that influence academic success (Garcia & Otheguy, 2017; Martinez, 2016). This line of thinking has established the idea that vocabulary – and more specifically, mainstream English vocabulary – is an important indicator of school readiness, and has contributed to the deficit thinking that children from lower-income families (often children of Color and those growing up in multilingual communities) are lacking the vocabulary to be successful (Adair, et. al, 2017).

Many studies on spatial language emphasize the quantity of spatial vocabulary words families use with their children. This includes counting the number of spatial terms to examine the relationship between parents' spatial language, children's spatial language, and their later spatial abilities (Pruden, Levine, & Huttenlocher, 2011). However, other scholars push us to think beyond spatial and math vocabulary. Moschkovitch (2007) explains that focusing on vocabulary alone is not very helpful for understanding what students know, describing how they communicate mathematically, or guiding instruction. Focusing too much on vocabulary narrows instruction, and much like the broader discourse on The Word Gap, is led by deficit thinking. Furthermore, most spatial language studies are approached from a monolingual norm which does not address the multilingual resources children use to communicate mathematically (Rubinstein-Avila et al., 2015).

As highlighted in the previous section, the findings from this dissertation illustrate many spatial terms the collaborators used (in English and Spanish), and highlighted *how* they used their spatial and mathematical language to make meaning in their spatial tasks by drawing on

their translingual and multimodal repertoire during their play. The spatial language and abilities brought forth by the children would likely not have been captured in a study more focused on counting particular words in particular ways.

Reframing Teacher Education

Teacher educators are most commonly thought to be university course instructors, field supervisors, or guiding classroom teachers. Some scholars have highlighted the potential contributions of "community-based teacher educators" (Zeichner, Bowman, Guillén, & Napolitan, 2016) to the field of teacher education, highlighting the knowledge that families and community members can impart to teachers. This ideological shift frames families and community members as teacher educators. Zeichner and colleagues (2016) articulate the importance of preparing teachers to work with and for communities instead of on them. This parallels the thinking surrounding the child-centered methodological framework I outlined in Chapter 3, emphasizing that research should be done *with* and *for* children, rather than *on* them.

Frameworks matter for how practices are conceptualized and taken up in pre-service teacher education. As McDonald, et al. (2013) describe, "Equity is not visible simply in what teachers do but also in the meanings and principles that guide how they view children, the relationships they build with children, how they draw on children's cultural knowledge, and the stance they take on the work of teaching" (p. 6). What if we extended the possibilities of including community-based members in teacher education to consider children's perspectives? How might listening to children, who also have their own prior knowledge, experiences, and understandings, open up new perspectives and impact the ways teacher candidates and teachers view and value children's everyday knowledge and practices? These considerations compliment the goal of creating opportunities for teachers to develop "an understanding of students',

families', and communities' 'funds of knowledge' to help them better serve and see their students" (Zeichner, et al., 2016, p. 279). This shift in framing might contribute to theoretical advances to counter deficit thinking about children and their language practices, a concept which continues to be a challenge in teacher education (Adair, 2014; Battey & Franke, 2015; Nieto, 2008). By preparing teachers to work with children in a way that acknowledges children as capable and knowledgeable agents we can all learn from, we can contribute to creating more equitable learning opportunities for children living in multilingual contexts. In the follow section, I describe implications for policy and practice, discussing how educators can use play as a tool for teaching and learning.

Play as a Tool for Teaching and Learning: Implications for Policy & Practice

In a time when educational policies continue to rely on constricted definitions of learning and achievement, often limiting educators from identifying and expanding on children's diverse range of competencies and funds of knowledge they bring to school, it is important to recognize the value of opening up spaces for exploration and the possibilities of using play as a tool for teaching and learning. In the following sections I describe the possibilities of using play for teacher candidate learning, supporting teachers in creating more playful learning spaces in the classroom, and using play as a form of formative assessment in school.

Teacher Candidate Learning Through Play

Even as playful learning opportunities have decreased in schools in recent years, it is still common to think about young children learning through play. It is less common, however, to think of play as a means for adult learning. Given the importance of connecting theory and practice, and countering deficit thinking in teacher education, in conjunction with the findings of this study, I suggest teacher educators use play as a tool for teacher candidate learning. Just as

agentic learning is important for expanding children's competencies beyond the acquisition of a narrow set of content and skills, as described by Adair (2014), it can be beneficial for teacher candidates themselves to "play" alongside children as they all have opportunities to explore, ask questions, and try out their own approaches, then evaluate themselves (Paris & Lung, 2008; Genishi & Dyson, 2009). Orellana and colleagues (2017) explain that this kind of opportunity has the potential to encourage teacher candidates to "counter deficit perspectives by noticing what kids were doing, not just what they were not, and to see children not just as students, learners, or objects of adults' socialization efforts but as full human beings and active agents in their own processes of development, with their own ideas about what they want to learn and do and create" (p. 16).

Deficit perspectives tend to frame children from non-dominant backgrounds as deficient in some way, often linguistically, culturally, and/or cognitively. This ideological framing has a significant impact on how policymakers, teachers, and administrators approach the education of these children. According to Adair, et al. (2017), "What teachers and administrators think about young children and their families influences what they think children deserve and can handle, and this determines what they end up offering young children in everyday classroom life, even in the earliest grades" (p. 328). Nieto (2008) explains that "questions of language are *pedagogical* as well as *ideological*" (p. 470) and calls for teacher education programs to support teachers in developing positive attitudes toward these students and their language practices. Similarly, Adair, et al. (2017) express the importance of teacher educators addressing pedagogical practices and deficit thinking at the same time in order to create more equitable learning experiences for children.

An ethnographic approach of closely observing children and learning has been used in

some teacher education programs to address deficit views of children and families from non-dominant groups, often drawing from the funds of knowledge perspective (DaSilva Iddings, Combs, & Moll, 2014; Reyes, DaSilva Iddings, & Feller, 2016). While much of the work on "funds of knowledge" tends to focus on adult perspectives (Rodriguez, 2013), other work has put the focus on children's agency, and has empowered teacher candidates to view children and learning "through their own unique professional lenses and to make their ideas more visible to themselves" (Orellana, et al., 2017, p. 12). In this approach, drawing from Wolcott's (2008) notion of ethnography as a way of seeing, Orellana and her colleagues saw teacher candidates guided into observing and describing children's everyday activities in play, and reflecting deeply on their own practices.[18] In a similar vein, the findings suggest what becomes visible when children are able to make their own decisions about representation and draw from their full linguistic and numeric repertoires for purposes that are meaningful to them (Orellana, et al., 2017). Through play, teacher candidates can reflect on these interactions with time to consider how children's competencies can be leveraged in their future classrooms, without simultaneously having to focus on whole group "classroom management" or predetermined lesson plans, as they often do in student teaching placements. Pre-service teachers have few opportunities to practice assessment in informal contexts (Wager & Parks, 2016), and play provides this opportunity before these educators enter their own classrooms. In particular, "practicing through play" can give pre-service teachers the chance to observe how children use language practices to carry out tasks that parallel the academic language demands pre-service teachers are asked to identify in their teacher preparation assessments. Wager and Parks (2016) add that future teachers need more support in attending to early mathematics than they are currently receiving in most methods

[18] See Orellana et al., (2017) for more background on this approach with illustrated examples of teacher candidate learning.

coursework, so suggest play as a way to focus on building on what children already know, as opposed to the deficit framing.

Furthermore, as I was reminded by the children in this study, more can be learned by engaging with children in their play as opposed to simply observing from afar. Playing alongside children affords the opportunity of seeing practices and processes unfold rather than focusing on products and outcomes at fixed points in time. What can be learned by teacher candidates in observing and listening to children closely? Engaging with children in their play has the potential to both deepen and expand teacher understanding of children and learning, as well as how teachers perceive their roles in the lives of the children they teach.

Supporting Playful Learning

It is crucial for administrators and policy makers to not only consider academic content, but also the kinds of learning experiences children have in school, especially in their early years (Adair, 2017). Fostering more playful learning spaces in classrooms holds immense benefits for children's academic learning and development. Creating playful, agentic learning spaces in which children can work on ideas and create representations for their own meaningful purposes (as they did in B-Club) allows them to explore and practice a variety of skills required for the twenty-first century, skills such as as flexible and creative thinking for problem-solving. As described in earlier chapters, accountability mandates such as standardized testing and time-intensive scripted literacy and math curricula have left little room for playful learning in preschool and elementary settings. These education policies have created high pressure conditions for teachers and families, often leading to learning approaches that emphasize short-term cognitive gains and turn children from a love of learning. What would it mean, instead, to

provide teachers time, support, and resources to implement more playful learning approaches in school?

Ms. R and the other early elementary school teachers at her school spent time reading about play and thinking together about how to support playful learning in their classrooms and developmental centers, as well as in other ways. They had questions about how to set up and guide play in meaningful ways that foster learning connected to curricular goals. These questions were consistent with the literature (i.e., Parks & Wager, 2015), calling attention to a need for teacher support in play. Both pre-service and in-service teachers would benefit from further training, resources, and support on how to create the conditions for playful learning spaces and how to scaffold children's experiences within them. Teachers who are intentional about scaffolding complex play enhance the benefits for their students (Ginsburg, 2006). Additionally, education policy needs to shift in order to give teachers time to create and support playful spaces in classrooms.

While we know playful learning spaces support a variety of skills and competencies, I suggest a few particular ones based on the findings from this study. More specifically, I suggest that teachers use playful learning spaces to foster collaboration, translanguaging pedagogy, and relational work in the classroom. My intention is not to suggest that this is the only way to support these areas; rather, I propose that playful learning can be an especially effective tool for doing so, as well as foster joyful learning for children.

Collaboration

The ability to collaborate with others, including building on others' ideas, is important for children's development (Alcalá, Rogoff, & López Fraire, 2018). Collaboration is also recognized as an important twenty-first century skill (Rogoff, et al., 2017) which is valued in schools,

workplaces, political institutions, and other organizations (Kuhn, 2015). Children must be able to effectively communicate and collaborate with team members, while being creative and flexible thinkers. Playful learning pedagogies promote key cognitive and social skills (Fisher, et al., 2010), making it a space to foster collaborative work. Rogoff and colleagues (2017) highlighted the need for designing learning situations and assessments that build on and are built toward the strengths of students, following an asset-based approach. I suggest that playful learning spaces be used to support children navigating decisions around when and how to collaborate in ways that are meaningful to them. These spaces would enable teachers to work with students on in-the-moment decisions, and help children draw on their full linguistic repertoires while doing so.

Translanguaging Pedagogy

A body of research suggests that teachers can use translanguaging pedagogy (Creese & Blackledge, 2010; García & Wei, 2014) as a tool to differentiate instruction in linguistically diverse classrooms (Martin-Beltran, et al., 2017) and as a way to "challenge traditional schooling structures that marginalize emerging bilinguals and their language practices" (Durán & Henderson, 2018, p . 85). Vogel and García (2017) call for further attention to "implications of translanguaging for inclusion and equity in teaching and learning" (p. 13). I suggest that play, which promotes metalinguistic awareness (Garvie, 1990; Gregory, 1996), be a tool for opening up space in classrooms for teachers to support children's translanguaging in meaningful ways. Play can create opportunities to foster that awareness for different purposes, such as shifting voices for different audiences and communicating subtle nuances of meaning (Martínez, 2010) in both monolingual and bilingual instructional contexts.

While there is some concern that translanguaging might not protect minoritized languages, Vogel and Garcia (2017) stress the importance of acknowledging the difference

between protection and isolation, and remind us that it is important for educators to understand that their students are always translanguaging, regardless of their classroom context. These understandings may further help teachers embrace more complex practices aligned with the communication demands of our increasingly multilingual worlds (D'Warte, forthcoming; Martínez, et al., forthcoming;). Pacheco, Daniel, Pray, and Jiménez (2019) argue for the importance of the linguistic diversity of teachers in being able to support students' translanguaging practices in the classroom. Even teachers who might identify as monolingual can strategically draw on and expand emerging translingual competence (Canagarajah, 2014) to support their students' translanguaging practices. For instance, Pacheco, et al. (2019) describe how a teacher recognized and adapted semiotic resources to support her students' participation, and developed Spanish competencies over time to use with her students to tap into their expertise.

Spatial Reasoning

As mentioned, spatial reasoning is important for early mathematics and literacy, but greater attention in both instruction and research is needed (Francis et al., 2017). Children expand spatial abilities not just by passively observing but by engaging in spatial activities to describe, represent, and navigate their environments. Children benefit from exploring shapes, parts of shapes, and how shapes transform, putting together maps and experimenting with perspective. Children need opportunities to represent these spatial activities in drawings, building constructions, dramatizations, and through verbal language. When teachers create the conditions for these kinds of activities, play can afford these opportunities. Creating a classroom space to encourage spatial and geometric exploration requires thoughtful planning, arrangement, selection, and introduction of materials (Clements, 2004; NRC, 2009). Creating these spaces in

which children can determine their own evolving play goals will enable them to participate in spatial tasks while drawing from their multilingual resources and everyday practices, just as I saw with the children at B-Club.

Relational Work

Playful learning spaces, unlike most intentional teaching spaces, open up the opportunity for children to work on different ideas and skills in relation to each other. Through play, children are able to work across the borders of disciplines and languages, using and developing literacy and mathematical practices simultaneously, while drawing from their full linguistic repertoires. This is not just across disciplines, but also within them. In many math or literacy curricula, lessons are developed around a particular math or literacy concept. For instance, a whole lesson or series of lessons might be focused on counting. In B-Club, however, the children did not just focus on counting the acorns, they counted while also sorting and categorizing, using spatial language and collaborative skills as they – simultaneously – decided how to best represent their collections while using various literacy skills. This enabled the collaborators to work on different mathematical practices in relation to other math and literacy practices, utilizing different languages and problem-solving skills all at the same time. Fostering relational work through play can help support children for using what they learned in more authentic and meaningful ways in the real world, while learning not just from their teachers, but from each other.

Play as Formative Assessment

How we assess children matters. It matters for what we see, and it matters for how children interpret their own understanding of what matters in school. Different kinds of assessments create very different kinds of opportunities. Sometimes we assume that what we see

– or don't see – is based on students' competencies rather than being a characteristic of the opportunities provided through that particular assessment.

As we know from other studies documenting literacy, mathematics, and language practices in informal contexts, many of the skills the children of this study demonstrated might not have been visible or recognized in more formal learning context in school (Gonzalez, et al., 2001). Formative assessment is about on-going feedback that can be used to inform instruction and learning (Torrance & Pryor, 1998). The purpose of formative assessment is to illuminate not only student learning but everyday instructional activity as well by providing information for classroom activities (Graue, 1993; Wager & Parks, 2016). Many in-school assessments are structured around children reaching particular benchmarks at a particular point in time, constraining what teachers are able to see. In order to build on what children already know while still identifying areas to work on, play can be used as a form of formative assessment in the classroom.

Scholars have suggested that play can serve as a space for assessing and promoting children's mathematical thinking by placing value on the process of observation (Wager & Parks, 2016). In their study, Wager and Parks (2016) found teachers were able to use what they learned from assessments during play to respond immediately to questions that arose during on-going play, as well as to plan for future activities to support children's learning. Other work encourages educators to learn from observing children's play in multilingual contexts (Long, Volk & Gregory, 2007). The findings from my study build on this work, suggesting how teachers can assess young children's literacy, numeracy, and language practices through play by observing how they use these practices in relation to each other. Dedicating time to observing children in their play will enable teachers to see practices and processes over time, occasions

which would often be missed in assessments that focus on products or benchmarks. These traditional types of assessments tend to decontextualize children's understanding, and overlook competencies in other areas (Wager, 2015). In the following sections, I suggest using play for: (1) assessing the aforementioned practices of collaboration, translanguaging, spatial reasoning, and relational work; (2) self-assessment; and, (3) ideology shifts in school values.

Collaboration, Translanguaging, Spatial Reasoning, and Relational Work

Building on the previous section about creating playful learning spaces for supporting collaboration, translanguaging, spatial reasoning, and relational work, this study's findings indicate the potential benefits of using play as a form of formative assessment for these particular practices. In order to support these types of practices which are not normally visible in much of the current curricula and classroom practices or that tend to value "individual solitary achievement" (Rogoff et al., 2017), there needs to be space for teachers to observe collaboration, translanguaging, spatial reasoning, and relational work. Playful spaces open up opportunities for children to collaborate with one another, making decisions in the moment. This allows teachers to see how children might attend to each other's efforts and adjust their own actions, sometimes including language and modes of representation in order to collaborate on the group's shared goals. Other times a teacher might see which children need more support in doing some of these things, or which need guidance in making decisions about when it would be helpful to collaborate or use different languages or modes to do so.

As articulated by Vogel and Garcia (2017), there is a need for further assessment on translanguaging, and play can help create the conditions for that assessment. In contrast to the typical assessments that require monolingual production of language, play allows teachers to see what children can do when they're able to draw from their full linguistic repertoire. Teachers can

attend to the different ways children use their language practices to accomplish different tasks that span content areas, especially when they aren't told exactly when and how to use their linguistic tools. This can give teachers an opportunity to see language practices that might not emerge in other contexts within the classroom, and may open up opportunities to recognize and extend particular translanguaging practices. For instance, a teacher may recognize a student shifting voices for different audiences in play, a practice related to academic writing standards (as Martínez, 2010, addresses), which can then be fostered in the curriculum.

Early mathematics, including spatial reasoning and geometry, is another competence that requires more attention on assessment (Wager & Parks, 2016). Children use complex spatial understanding through many types of playful activities in ways that go beyond the spatial abilities teachers can see in early math curricula. In my study, this was displayed by the kindergartners' understandings of perspective as demonstrated in their play activities. These children also used translanguaging skills to accomplish math-related tasks which, like most content area assessments, would typically be limited to monolingual norms (García & Ascenzi-Moreno, 2016; Vogel & Garcia, 2017). Playful learning spaces open up opportunities for teachers to observe practices that may extend beyond the standards on set skills and abilities, then use those understandings in math and literacy instruction. Furthermore, this type of assessment would allow teachers to see what children can do in relation to each other in a number of areas, and leverage this understanding to inform their teaching. Observing children in play spaces can allow teachers to learn more about their students and their resources.

Self-Assessment

Playful spaces not only open up opportunities for teachers to see what children can do, but enable children themselves to see, experience, and reflect on their own competencies and

progress. This process can be further fostered by having space to play with instructional support in the classroom. This type of self-assessment can include particular academic goals, but can also go beyond narrow benchmarks of success to include a variety of competencies for children to participate in the kinds of activities they value. It is important for children to see what they can do in varied activities that involve math, literacy, and language, including what they are able to do with others. Children's early learning experiences are crucial to how children will think about themselves as learners (Adair, et al., 2017).

Ideological Shifts in School Values

What we assess communicates value and importance. We can say that it is important for children to be able to collaborate, use biliteracy skills, or problem-solve in authentic ways, but is that what we truly assess in school? In regard to language practices, Martínez (2017) explains that even in most bilingual classroom settings, children are taught to communicate with monolingual audiences, and by not creating space for students to speak and write for bilingual audiences (and assessing those abilities), it is communicated to bilingual students that bilingual audiences are not worth communicating with. Similarly, children who are not given the space to create representations from their own perspective may receive the message that their representations aren't for themselves, that their own perspectives aren't important. Zisselsberger (2016) suggests ways of "leveling" or raising the value of the type of learning that happens in community contexts by recognizing everyday practices just as often as those found in schools. By creating forms of assessment that open up space for agency in play, there is potential to capture a fuller range of children's meaning-making abilities – and also communicate that those things matter.

Conclusion

> "Miss!" Anthony100 exclaims when I walk into the classroom. Rosa waves from across the room. Ben10 smiles and asks, "Remember when we found all the acorns?" Emita walks over to me and says, "You haven't been here in a while. Do you still have the acorns?"

In many ways, this dissertation starts and ends with the children and the acorns. On our first day together in "Mini B-Club," the children set off to explore the school and came across the acorns and started collecting them. The video, photos, and field notes documented the skillful ways these children negotiated decisions about how to represent the acorns using collaboration, language, literacy, and numeracy practices. However, I don't think I needed the documentation to remember what I would describe as the pure joy and excitement these children felt as they played together, collecting and documenting those acorns. Almost a year later, with smiles on their faces, the children remembered collecting the acorns. Months after this, they shared memories of the activity, discussed new ways of playing with and representing the acorns, including whom they could show them to, and talked about how they could collect even more.

The interactions I detailed from this study, including those from the Acorn activity, demonstrate how my collaborators drew from their linguistic and numeric resources as they created representations in their play. In addition to contributing to a growing body of research on young children's everyday literacy and numeracy practices in multilingual contexts, I hope the findings from this study will further extend theoretical understandings of how to leverage young children's competencies across the traditional borders of languages and school curricula. As I suggest, play can be used as a tool for teaching and learning in order to create more equitable learning opportunities for linguistically- and culturally-diverse children. It is my hope that this study will lead to pedagogical practices that better account for children's complex experiences

and understandings of their multilingual worlds. Further, I hope this study demonstrates how play can nurture joyful learning, and how children can learn and draw from all kinds of competencies when they're motivated to do so, just as the children did with their acorns and other activities at B-Club. I end this dissertation highlighting these children's voices, with a vignette from my most recent visit, when we continued to discuss the acorns:

> Anthony100 asks where the acorns are. I tell him I have them at home, and ask if I should bring them next time so they can keep them. "Yeah." "Sí" "Yay!" Emita smiles and says then they can show their families. Ben10 adds that they can play with the acorns at home. Anthony100 suggests dividing them up so everyone has some. "Maybe we can send them to Rambo Bebé and Natasha Bebé," he tells us because the sisters have moved to another part of the city. "Yeah, like a package," says Emita. I tell the children I will see if someone at the school has their new address. "Does anyone remember how many we have?" Anthony100 asks. "We wrote it somewhere." He explains that we could have figured out how many each of us would get. Rosa smiles and says, "¡Muchos!" and explains we can just count next time. Emita tells me that I should keep some too, and the others agree. Ben10 adds, "And then we can go find even more acorns!"

APPENDIX A

List of B-Club Activities

- Acuerdos
- Exploring the school
    - Acorns
- Decorating journals
- Paper Airplanes
- Building casas (with various materials)
- Building a spaceship
- Making nametags
- Recording video
- Playing board games (Jenga, Sorry, Trouble, glasses game)
- Building with blocks
- Superheroes!
- Making party hats
- Frisbee
- Drawing on the whiteboard
- Community walk talks
- Making slime
- Playing with a ball
- Playing soccer
- Community photos
- Writing cards or letters
- Arcade games
- Writing books

APPENDIX B

Synoptic Chart

Day	Note	Date	Context	Location	Activities	Data Sources	Collaborators
1	1	9/12/2017	After-school	Playground	Meeting with after-school director, kids playing outside	Field notes	
2	1	10/3/2017	After-school	Playground	Playing tag	Field notes	Emita, Rosa, Rambo, Natasha, Ben10, Anthony100
2	2	10/3/2017	After-school	Classroom	Classroom activities, Simon says, songs	Field notes	Rosa, Rambo, Natasha, Ben10, Anthony100
2	3	10/3/2017	After-school	Classroom	Homework, coloring, reading	Field notes	Rosa, Rambo, Natasha, Ben10, Anthony100
3	1	10/10/2017	After-school	Parent center	Meeting with after-school director	Field notes	
3	2	10/10/2017	After-school	Classroom	Meeting with teacher	Field notes	
4	1	10/12/2017	After-school	Playground	Handing out consent forms	Field notes	Rosa, Rambo, Natasha, Ben10, Anthony100
5	1	10/17/2017	B-Club (Mini)	Upper field	What is B-Club, acuerdos, school walk, Acorns	Field notes, video, photos	Rosa, Rambo, Natasha, Ben10, Anthony100
5	2	10/17/2017	After-school	Classroom	Reading (Acorns), paper airplanes	Field notes, interviews	Rosa, Rambo, Natasha, Ben10, Anthony100
6	1	10/24/2017	School	Classroom	Read-alouds, coloring fall worksheet, developmental stations	Field notes, photos, interview	Emita, Rosa, Rambo, Natasha, Ben10, Anthony100
6	2	10/24/2017	B-Club (Mini)	Multi-purpose room	Reviewing acuerdos, introducing journals, paper airplanes	Field notes, video, photos, artifacts	Emita, Rosa, Rambo, Natasha, Ben10, Anthony100
6	3	10/24/2017	After-school	Classroom	Reading, homework	Field notes, interviews	Rosa, Rambo, Natasha, Ben10, Anthony100
7	1	11/7/2017	School	Classroom, playgrounds	Full-day, with reading and developmental stations	Field notes, photos, interview	Emita, Rosa, Rambo, Natasha, Ben10, Anthony100
7	2	11/7/2017	B-Club (Mini)	Multi-purpose room	Building houses, writing in journals	Field notes, video, photos, artifacts	Emita, Rosa, Rambo, Natasha, Ben10, Anthony100

Day	Note	Date	Context	Location	Activities	Data Sources	Collaborators
7	3	11/7/2017	After-school	Classroom	Homework and reading, talk about B-Club	Field notes	Rosa, Rambo, Natasha, Ben10, Anthony100
8	1	11/16/2017	After-school	Orange room	Thanksgiving party	Field notes	Rosa, Rambo, Natasha, Anthony100
9	1	12/13/2017	School	Classroom	Clean-up, talking with teacher	Field notes, interview	Emita, Rosa, Rambo, Natasha, Ben10, Anthony100
9	2	12/13/2017	After-school	Parking lot, field	Checking-in, cards	Field notes	Rosa, Rambo, Natasha, Ben10
10	1	1/18/2018	After-school	Classroom	Checking-in	Field notes	Rosa, Rambo, Natasha, Ben10
10	2	1/18/2018	B-Club	Multi-purpose room	Parent Meeting	Field notes	Rambo, Natasha
11	1	1/23/2018	B-Club	Multi-purpose room	Nametags, video recording, Jenga, blocks, building houses with chairs	Field notes, video, photos	Emita, Rosa, Rambo, Natasha, Ben10, Anthony100
12	1	1/25/2018	School	Classroom	Developmental stations	Field notes, photos	Rosa, Rambo, Natasha, Ben10, Anthony100
12	2	1/25/2018	B-Club	Multi-purpose room,	Building houses, drawing characters, drawing and writing, imaginary play, Frisbee, party hats	Field notes, video, photos	Rosa, Rambo, Natasha, Ben10, Anthony100
13	1	1/30/2018	School	Classroom, playgrounds	Circle, groups, math, recess, developmental stations	Field notes, photos, interview	Emita, Rosa, Rambo, Natasha, Ben10, Anthony100
13	2	1/30/2018	B-Club	Multi-purpose room, playground	Spaceship imaginative play, paper airplanes, whiteboard, community walk talks, Houses & Casas	Field notes, video, photos	Rosa, Rambo, Natasha, Ben10, Anthony100
14	1	2/1/2018	B-Club	Multi-purpose room, playground	Building houses, writing names, whiteboard, slime, ball	Field notes, video, photos	Rosa, Rambo, Natasha, Anthony100
15	1	2/6/2018	School	Classroom	Developmental stations	Field notes, photos, interview	Emita, Rosa, Rambo, Natasha, Ben10, Anthony100
15	2	2/6/2018	B-Club	Multi-purpose room, playground	Building houses with older kids, puppets, soccer, games	Field notes, video, photos	Emita, Rosa, Rambo, Natasha, Ben10, Anthony100
16	1	2/8/2018	B-Club (Mini)	Upper field	Community photos, journals, Acorns	Field notes, video, photos, artifacts	Emita, Rosa, Rambo, Natasha, Ben10, Anthony100

Day	Note	Date	Context	Location	Activities	Data Sources	Collaborators
17	1	2/13/2018	School	Classroom, playground	Math work, recess, firefighter activity	Field notes, photos, interview	Emita, Rosa, Rambo, Natasha, Ben10, Anthony100
17	2	2/13/2018	B-Club	Multi-purpose room	Valentine's Day cards, playdough, taking photos, building houses, building with blocks	Field notes, video, photos	Emita, Rosa, Rambo, Natasha, Ben10, Anthony100
18	1	2/20/2018	School	Library, Classroom	Library books, police activity, developmental stations	Field notes, photos, interview	Emita, Rosa, Rambo, Natasha, Ben10, Anthony100
18	2	2/20/2018	B-Club	Multi-purpose room, upper field	Building houses, superhero mission, building with blocks, letters from el Maga	Field notes, video, photos	Emita, Rosa, Rambo, Natasha, Ben10, Anthony100
19	1	2/21/2018	B-Club (Mini)	Multi-purpose room,	Building a house, drawing the house, puppets, Acorns	Field notes, video, photos, artifacts	Emita, Rosa, Rambo, Natasha, Ben10, Anthony100
20	1	2/22/2018	B-Club	Multi-purpose room,	Building houses, Superheroes!, letters, drawing interpretations	Field notes, video, photos, artifacts	Emita, Rambo, Natasha, Ben10, Anthony100
21	1	2/27/2018	School	Classroom	Math work, developmental stations, conference prep	Field notes, photos, audio	Emita, Rosa, Rambo, Natasha, Ben10, Anthony100
21	2	2/27/2018	After-school	East Upper Field	Community photos, journals, Acorns	Field notes, video, photos, artifacts	Rambo, Natasha
21	3	2/27/2018	B-Club	Classroom (conferences)	Playing Sorry and Trouble	Field notes, video	Natasha, Rambo, Rosa
22	1	3/1/2018	B-Club	Classroom (conferences)	Writing on paper, glasses game, talking outside, poker with T's brother	Field notes, video, photos	Natasha, Rambo, Rosa
23	1	3/5/2018	School	Classroom, Coconut Grove	Lee conmigo, assembly practice, assembly	Field notes, interviews	Emita, Rosa, Rambo, Ben10, Anthony100
24	1	3/6/2018	B-Club	Multi-purpose room, playground	Superheroes!, photo interviews	Field notes, video, photos	Ben10 and other B-Club members
25	1	3/8/2018	B-Club	Multi-purpose room	Building with cardboard, building a house	Field notes, video, photos	Ben10, Rosa, Natasha, Rambo, Emita
26	1	3/13/2018	School	Classroom, Coconut Grove	Lee conmigo, writing, assembly, math, recess, plant activity, developmental stations	Field notes, photos, interview	Ben10, Rosa, Rambo, Emita, Anthony100
26	2	3/13/2018	B-Club	Multi-purpose room	Skee-Ball, Legos, reading, writing cards, Superheroes!	Field notes, video, photos	Emita, Ben10, Rosa, Natasha, Rambo, Anthony100
27	1	3/15/2018	B-Club	Multi-purpose room	Writing books, Legos, cardboard house, Superheroes!	Field notes, video, photos	Emita, Ben10, Natasha, Rambo, Anthony100

Day	Note	Date	Context	Location	Activities	Data Sources	Collaborators
28	1	3/20/2018	School	Classroom, playground, library	Lee conmigo, morning routine, recess, library, reading	Field notes, photos, interview	Emita, Ben10, Rosa, Natasha, Rambo, Anthony100
29	1	3/22/2018	School	Classroom, outside	Getting ready for open house, whiteboards, sharing storyboard outside	Field notes, audio	Emita, Ben10, Rosa, Natasha, Rambo, Anthony100
29	2	3/22/2018	B-Club	Multi-purpose room, playground	Celebration/Open House	Field notes, photos	Emita, Ben10, Rosa, Natasha, Rambo, Anthony100
30	1	4/10/2018	After-school	Classroom	Games, painting	Field notes, photos	Rambo Bebé, Rosa
30	2	4/10/2018	Outside of school	Neighborhood	Community walk	Field notes, photos, audio, interview	Anthony10
31	1	4/17/2018	B-Club	Multi-purpose room, playground	Secret names	Field notes, photos	Rosa, Anthony100, Ben10
31	2	4/17/2018	Outside of school	Neighborhood	Community walk	Field notes, photos, audio, interview	Rambo Bebé, Natasha Bebé
32	1	5/24/2018	School	Classroom, playground	Read-aloud, practicing for assembly	Field notes	Rambo Bebé, Emita, Rosa, Ben10
32	2	5/24/2018	B-Club	Multi-purpose room, playground	Showing photos and videos to follow up	Field notes, audio	Ben10, Rosa, Natasha, Rambo, Anthony100
33	1	5/31/2018	B-Club	Multi-purpose room, playground	Celebration, follow-up with Emita	Field notes, audio	Emita, Ben10, Rosa, Natasha, Rambo, Anthony100

REFERENCES

Abreu, G. (1995). Understanding how children experience the relationship between home and school mathematics. *Mind, Culture, and Activity*, 2(2), 119-142.

Adair, J.K. (2014). School-based agency as expanding capabilities: What it could mean for young children in the early grades, *Harvard Educational Review*, 84(2).

Adair, J.K., Colegrove, K.S.S., & McManus, M.E. (2017). How the word gap argument negatively impacts young children of Latinx immigrants' conceptualizations of learning. *Harvard Educational Review*, 87(3), 309-334.

Alcalá, L., Rogoff, B., & Fraire, A.L. (2018). Sophisticated collaboration is common among Mexican-heritage U.S. children. *Proceedings of the National Academy of Sciences*, 115(45), 11377-11384.

Anzaldúa, G. (1987). *Borderlands: La frontera* (vol. 3). San Francisco: Aunt Lute.

Avineri, N., Johnson, E.J., Brice-Heath, S., McCarty, T., Ochs, E., Kremer-Sadlik, Blum, S., Zentella, A.C., Rosa, J.D., Flores, N., Alim, H.S., & Paris, D. (2015). Invited forum: bridging the "Language gap." Journal of Linguistic Anthropology, 25(1), 66-86.Ball, D.L., & Forzani, F.M. (2009). The work of teaching and the challenge for teacher education. *Journal of teacher education*, 60(5), 497-511.

Bandura, A., Barbaranelli, C., Caprara, G.V., & Pastorelli, C. (2001). Self-efficacy beliefs as shapers of children's aspirations and career trajectories. *Child Development*, 72(1), 187-206.

Baroody, A.J. (2004). The developmental bases for early childhood number and operations standards. In D.H. Clements, J. Sarama, & A.-M. DiBiase (Eds.), *Engaging young children in mathematics: Standards for early childhood mathematics education*, (pp. 173-219). Mahwah, NJ: Lawrence Erlbaum Associates.

Battey, D., & Franke, M. (2015). Integrating professional development on mathematics and equity: Countering deficit views of students of color. *Education and Urban Society*, 47(4), 433– 462.

Bazeley, P. (2013). *Qualitative data analysis: Practical strategies*. London: Sage.

Bell-Rose, S. & Desai, V. (2006). *Educating leaders for a global society*. New York: Asia Society.

Bengochea, A., Sembiante, S.F., & Gort, M. (2018). An emergent bilingual child's multimodal choices in sociodramatic play. *Journal of Early Childhood Literacy*, 18(1), 38-70.

Bennett, E., & Weidner, J. (2012). *Everyday maths through everyday provision: Developing opportunities for mathematics in the early years*. London: Taylor & Francis.

Bishop, A.J., & Abreu, G.D. (1991). Children's use of outside-school knowledge to solve mathematics problems in-school. *Proceedings of the fifteenth International Conference for the Psychology of Mathematics Education,* (vol. 1, pp. 128-135), Assisi, Italy.

Bodrova, E. (2008). Make-believe play versus academic skills: A Vygotskian approach to today's dilemma of early childhood education. *European Early Childhood Education Research Journal*, 16(3), 357-369.

Bucknall, S. (2012). Children as researchers in primary schools. *Choice, voice and participation*. London: Routledge.

Cameron, A., Hersch, S.B., & Fosnot, C.T. (2005). *Exploring soda machines, grades 3-5: A context for division: Facilitator's guide*. Portsmouth, NH: Heinemann.

Campbell, A.E., Davis, G.E., & Adams, V.M. (2007). Cognitive demands and second-language learners: A framework for analyzing mathematics instructional contexts. *Mathematical Thinking and Learning*, 9(1), 3-30.

Campbell, F.A., Pungello, E.P., Miller-Johnson, S., Burchinal, M., & Ramey, C.T. (2001). The development of cognitive and academic abilities: Growth curves from an early childhood education experiment. *Developmental Psychology*, 37, 231–242.

Campbell, F.A. & Ramey, C.T. (1995). Cognitive and school outcomes for high-risk African-American students at middle adolescence: Positive effects of early intervention. *American Educational Research Journal*, 32, 743–772.

Canagarajah, A.S. (1995). Functions of codeswitching in ESL classrooms: Socialising bilingualism in Jaffna. *Journal of Multilingual & Multicultural Development*, 16(3), 173-195.

Canagarajah, S. (2014). Theorizing a competence for translingual practice at the contact zone. *The multilingual turn: Implications for SLA, TESOL, and bilingual education,* (p. 78-102). New York: Routledge.

Canagarajah, S. (2012). *Translingual practice: Global Englishes and cosmopolitan relations*. New York: Routledge.

Carpenter T.P., & Lehrer, R. (1999) Teaching and learning mathematics with understanding. In E. Fennema & T.R. Romberg (Eds.), *Mathematics classrooms that promote understanding*. Mahwah, NJ: Erlbaum.

Carpenter, T.P., Fennema, E., & Franke, M.L. (1996). Cognitively guided instruction: A knowledge base for reform in primary mathematics instruction. *The Elementary School Journal*, 97(1), 3-20.

Carraher, D. (1991). Mathematics in and out of school: A selective review of studies from Brazil. In M. Harris (Ed.), *Schools, Mathematics, and Work.* Philadelphia: The Falmer Press.

Carraher, T.N., Carraher, D.W., & Schliemann, A.D. (1985). Mathematics in the streets and in schools. *British Journal of Developmental Psychology*, 3(1), 21-29.

Christensen, P., & James, A. (Eds.). (2008). *Research with children: Perspectives and practices*, (2nd ed.). London: Routledge.

Civil, M. (2002). Everyday mathematics, mathematicians' mathematics, and school mathematics: Can we bring them together?. *Journal for Research in Mathematics Education, Monograph,* vol. 11, 40-62.

Civil, M. (April, 1994) Connecting the home and school: Funds of knowledge for mathematics teaching and learning. *American Educational Research Association Annual Conference*. New Orleans, LA.

Clements, D.H. (2004). Geometric and spatial thinking in early childhood education. In D.H. Clements, J. Serama & A.-M. DiBiase (Eds.), *Engaging young children in mathematics: Standards for early childhood mathematics education,* (pp. 267-297). Mahwah, NJ: Lawrence Erlbaum Associates.

Clements, D.H. (1999). Geometric and spatial thinking in young children. In J.V. Copley (Ed.), *Mathematics in the early years,* (pp. 66-79). Reston, VA: National Council of Teachers of Mathematics.

Cochran-Smith, M. (1991). Learning to teach against the grain. *Harvard Educational Review*, 61(3), 279-311.

Cole, M. & Distributed Literacy Consortium (2006). *The fifth dimension: An after-school program built on diversity*. New York: Russell Sage Foundation.

Colegrove, K.S.S., & Adair, J.K. (2014). Countering deficit thinking: Agency, capabilities and the early learning experiences of children of Latina/o immigrants. *Contemporary Issues in Early Childhood*, 15(2), 122-135.

Cook, V.J. (2001). Using the first language in the classroom. *Canadian Modern Languages Review*, 57(3), 402-423.

Copple, C., & Bredekamp, S. (2009). *Developmentally appropriate practice in early childhood programs serving children from birth through age 8*. Washington, DC: National Association for the Education of Young Children.

Corsaro, W.A. (2005). Collective action and agency in young children's peer cultures. *Studies in modern childhood,* (pp. 231-247). London: Palgrave Macmillan.

Corsaro, W. A. (1997). *The sociology of childhood,* (pp. 4-5). Thousand Oaks, CA: Pine Forge Press.

Corsaro, W.A., & Miller, P.J. (1992). *Interpretive approaches to children's socialization*. San Francisco: Jossey-Bass.

Creese, A., & Blackledge, A. (2010). Translanguaging in the bilingual classroom: A pedagogy for learning and teaching? *The Modern Language Journal*, 94(1), 103-115.

Cromdal, J., & Aronsson, K. (2000). Footing in bilingual play. *Journal of Sociolinguistics* 4(3). 435–457.

Cummins, J., & Swain, M. (1986). Bilingualism in education. New York: Longman Green.

D'Ambrosio, U. (1985). Ethnomathematics and its place in the history and pedagogy of mathematics. *For the Learning of Mathematics*, 5(1), 44-48.

D'Ambrosio, U. (1993). Etnomatemática: um programa [Ethnomathematics: A program]. *A Educação Matemática em Revista*, 1(1), 5-11.

Darling-Hammond, L., & Bransford, J. (2007). *Preparing teachers for a changing world: What teachers should learn and be able to do*, (2nd ed.). Hoboken, NJ: John Wiley.

Iddings, A. C. D., Combs, M. C., & Moll, L. C. (2014). English language learners and partnerships with families, communities, teacher preparation, and schools. *Handbook of urban education*, 188-196.Dell Clark, C.D. (2011). *In a younger voice*: *Doing child-centered qualitative research*. New York: Oxford University Press.

Domínguez, H. (2011). Using what matters to students in bilingual mathematics problems. *Educational Studies in Mathematics*, 76(3), 305-328.

Dúran, L. & Henderson, K. (2018). Pockets of hope: Cases of linguistic flexibility in the classroom. *EuroAmerican Journal of Applied Linguistics and Languages*, 5(2), 76-90.

D'Warte, J. (forthcoming). In I. García-Sánchez & M.F. Orellana (Eds.), *Language and cultural practices in communities and schools: Bridging learning for students from non-dominant groups.* New York: Routledge.

D'Warte, J. (2016). Students as linguistic ethnographers: Super-diversity in the classroom context. *Super dimensions in globalisation and education*, (pp. 19-35). Singapore: SpringerNature.

Dyson, A.H. (2003). *The brothers and sisters learn to write.* New York: Teachers College Press.

Dyson, A.H. (1999). Transforming transfer: Unruly children, contrary texts, and the persistence of the pedagogical order. *Review of Research in Education*, 24(1), 141-171.

Dyson, A.H. (1997). *Writing superheroes: Contemporary childhood, popular culture, and classroom literacy*. New York: Teachers College Press.

Dyson, A.H., & Genishi, C. (2005). *On the case*: *Approaches to Language and Literacy Research*. New York: Teachers College Press.

Elkind, D. (2007). *The power of play: How spontaneous, imaginative activities lead to happier, healthier children*. Boston: Da Capo Lifelong Books.

Emerson, R.M., Fretz, R.I., & Shaw, L.L. (1995). *Writing ethnographic field notes: Chicago guides to writing, editing, and publishing*. Chicago: University of Chicago Press.

Falchi, L., Axelrod, Y., & Genishi, C. (2013). 'Miguel es un artista' – and Luisa is an excellent student: Seeking time and space for children's multimodal practices. *Journal of Early Childhood Literacy*, 14(3), 1-22.

Fang, Z. (2006). The language demands of science reading in middle school. *International Journal of Science Education*, 28(5), 491-520.

Fang, Z., Schleppegrell, M.J., & Cox, B.E. (2006). Understanding the language demands of schooling: Nouns in academic registers. *Journal of Literacy Research*, 38(3), 247-273.

Fennimore, B.S., & Goodwin, A.L. (Eds.). (2011). *Promoting social justice for young children* (vol. 3). Singapore: Springer Science & Business Media.

Fisher, K.R., Hirsh-Pasek, K., Golinkoff, R.M., Singer, D., & Berk, L.E. (2010). Playing around in school: Implications for learning and educational policy. In A. Pellegrini (Ed.), *The Oxford handbook of the development of play*. New York: Oxford University Press.

Flores, N., & Lewis, M. (2016). From truncated to sociopolitical emergence: A critique of super-diversity in sociolinguistics. *International Journal of the Sociology of Language, 2016,* (241), 97-124.

Francis, K., Bruce, C., Davis, B., Drefs, M., Hallowell, D., Hawes, Z., ... & Sinclair, N. (2017). Multidisciplinary perspectives on a video case of children designing and coding for robotics. *Canadian Journal of Science, Mathematics and Technology Education*, *17*(3), 165-178.

Franco, J., Orellana, M., & Franke, M. (2019). "Castillo Blueprint": How young children in multilingual contexts demonstrate and extend literacy and numeracy practices in play. *Journal of Early Childhood Literacy*. https://doi.org/10.1177/1468798419841430.

Franke, M. (1996). Fostering young children's mathematical understanding. In C. Howes (Ed.), *Teaching 4- to 8-year-olds: Literacy, math, multiculturalism, and classroom community*. Baltimore: Brookes Publishing Co.

Freudenhall, H. (1973) Mathematics as an Educational Task. Dordrecht, Netherlands: Reidel, 1973.

Fuller, B. (2007) *Standardized childhood: The political and cultural struggle over early education.* Stanford, CA: Stanford University Press.

Gallas, K. (2003). *Imagination and literacy: A teacher's search for the heart of learning*. New York: Teachers College Press.

García, O. (2013). Countering the dual: Transglossia, dynamic bilingualism, and translanguaging in education. *The global-local interface and hybridity: Exploring language and identity*, 100-118. Bristol, UK: Multilingual Matters.

García, O. 2009. Education, multilingualism and translanguaging in the 21st Century. In A.K. Mohanty, M. Panday, R. Phillipson, & T. Skutnabb-Kangas (Eds.), *Multilingual education for social justice: Globalising the local*, (pp. 140–158). New Delhi: Orient BlackSwan.

García, O., & Ascenzi-Moreno, L. (2016). Assessment in school from a translanguaging angle. *Gegenwärtige Sprachkontakte im Kontext der Migration. Heidelberg, Germany: Universitätsverlag Winter*.

García, O., & Otheguy, R. (2017). Interrogating the language gap of young bilingual and bidialectal students. *International Multilingual Research Journal*, *11*(1), 52-65.

García, O., & Kleifgen, J.A. (2010). *Educating emergent bilinguals: Policies, programs, and practices for English language learners*. New York: Teachers College Press.

García, O., & Wei, L. (2014). Translanguaging and education. *Translanguaging: Language, bilingualism, and education* (pp. 63-77). London: Palgrave Macmillan.

Gardner, H. (1995). *The unschooled mind: How children think and how schools should teach*. New York, NY: Basic Books.

Garvie E. (1990). *Story as vehicle: Teaching English to young children* (Vol. 57). Multilingual Matters Limited.

Geertz, C. (1973). *The interpretation of culture*. New York: Basic Books.

Genishi, C., & Dyson, A.H. (2012). Racing to the top: Who's accounting for the children? *Occasional Paper Series*, *2012* (27), 6.

Genishi, C. & Dyson, A.H. (2009). *Children, language, and literacy: Diverse learners in diverse times*. New York: Teachers College Press.

Ghose, M. (2007). *Exploring the everyday. Ethnographic approaches to literacy and numeracy.* New Delhi: Nirantar.

Gibbons, P. (2009). *English learners, academic literacy, and thinking*. Portsmouth, NH: Heinemann.

Ginsburg, H.P. (2006). Mathematical play and playful mathematics: A guide for early education. *Play = Learning: How play motivates and enhances children's cognitive and social-emotional growth*, 145-165. New York: Oxford University Press.

González, N., Andrade, R., Civil, M., & Moll, L. (2001). Bridging funds of distributed knowledge: Creating zones of practices in mathematics. *Journal of Education for Students Placed at Risk,* 6(1-2), 115-132.

Goodwin, C., & Goodwin, M.H. (1996). Seeing as situated activity: Formulating planes. *Cognition and Communication at Work,* 61-95.

Gort, M. (2012). Code-switching patterns in the writing-related talk of young emergent bilinguals. *Journal of Literacy Research,* 44(1), 45-75.

Gort, M. (2006). Strategic codeswitching, interliteracy, and other phenomena of emergent bilingual writing: Lessons from first grade dual language classrooms. *Journal of Early Childhood Literacy,* 6(3), 323-354.

Gort, M. & Pontier, R. W. (2013). Exploring bilingual pedagogies in dual language preschool classrooms. Language and Education, 27(3), 223-245.

Gort, M., & Sembiante, S.F. (2015). Navigating hybridized language learning spaces through translanguaging pedagogy: Dual language preschool teachers' languaging practices in support of emergent bilingual children's performance of academic discourse. *International Multilingual Research Journal,* 9(1), 7-25.

Grant, C., & Gibson, M. (2011). Diversity and teacher education. *Studying diversity in teacher education,* (pp. 19-64). Lanham, MD: Rowman & Littlefield.

Graue, M.E. (2008). Teaching and learning in a post-DAP world. *Early Education and Development,* 19, 441– 447.

Graue, M.E. (1993). Integrating theory and practice through instructional assessment. *Educational Assessment,* 1, 293–309.

Gregory, E. (1996) Making Sense of a New World: Learning to Read in a Second Language. London: Sage.

Greenberg, A., Bellana, B., & Bialystok, E. (2013). Perspective-taking ability in bilingual children: Extending advantages in executive control to spatial reasoning. *Cognitive development*, *28*(1), 41-50.

Grosjean, F. (1989). Neurolinguists, beware! The bilingual is not two monolinguals in one person. *Brain and Language,* 36(1), 3-15.

Grossman, P., Hammerness, K., & McDonald, M. (2009). Redefining teaching, re-imagining teacher education. *Teachers and Teaching: Theory and Practice,* 15(2), 273-289.

Grossman, P., & McDonald, M. (2008). Back to the future: Directions for research in teaching and teacher education. *American Educational Research Journal*, 45(1), 184-205.

Gumperz, J.J., & Cook-Gumperz, J. (2005). Language standardization and the complexities of communicative practice. In S. McKinnon & S. Silverman (Eds.), *Complexities: Beyond Nature and Nurture*, (pp. 268-289). Chicago: University of Chicago Press.

Gutiérrez, K.D., Baquedano-López, P., Alvarez, H.H., & Chiu, M.M. (1999). Building a culture of collaboration through hybrid language practices. *Theory into Practice*, 38(2), 87-93.

Gutiérrez, K.D., & Rogoff, B. (2003). Cultural ways of learning: Individual traits or repertoires of practice. *Educational Researcher*, 32(5), 19-25.

Hart, B., & Risley, T. R. (1995). *Meaningful differences in the everyday life of America's children.* Baltimore, MD: Paul Brookes.Heath, S.B. (1983). *Ways with words: Language, life and work in communities and classrooms*. Cambridge, UK: Cambridge University Press.

Heller, M. (2006). *Linguistic minorities and modernity: A sociolinguistic ethnography*, (2nd Ed). London: Continuum.

Heller, M., & Martin-Jones, M. (Eds.). (2001). *Voices of authority: Education and linguistic difference* (vol. 1). Westport, CT: Greenwood Publishing Group.

Hiebert, J., & Carpenter, T.P. (1992). Learning and teaching with understanding. In D.A. Grouws (Ed.), *Handbook of research on mathematics teaching and learning*, (pp. 65-98). New York: Macmillan.

Hirsh-Pasek, K., Golinkoff, R.M., Berk, L.E., & Singer. D.G. (2008). *A mandate for playful learning in school: Presenting the evidence.* New York: Oxford University Press.

Hood, S., Kelley, P., & Mayall, B. (1996). Children as research subjects: A risky enterprise. *Children & Society*, 10(2), 117-128.

Hornberger, N.H. (2005). Opening and filling up implementational and ideological spaces in heritage language education. *Modern Language Journal*, 89, 605.

Hornberger, N.H., & Link, H. (2012). Translanguaging and transnational literacies in multilingual classrooms: A biliteracy lens. *International Journal of Bilingual Education and Bilingualism*, 15(3), 261-278.

Horner, B., Lu, M.Z., Royster, J.J., & Trimbur, J. (2011). Language difference in writing: Toward a translingual approach. *College English*, 73(3), 303-321.

James, A., Jenks, C., & Prout, A. (1998). *Theorizing childhood*. New York: Teachers College Press.

James, A., & Prout, A. (1997). Introduction: Constructing and reconstructing childhood. *Constructing and reconstructing childhood: Contemporary issues in the sociological study of childhood.* London: Falmer.

Johnson, E. J. & Zentella, A. C. “Introducing the Language Gap”. International Multilingual Research Journal, 11(1), 2017, 1–4.

Kagan, S.L., & Lowenstein, A.E. (2004). School readiness and children’s play: Contemporary oxymoron or compatible option. In E.F. Zigler, D.G. Singer, & S.J. Bishop-Josef (Eds.), *Children’s play: The roots of reading*, (pp. 59-76). Washington, DC: Zero to Three Press.

Kamii, C. (1991). Toward autonomy: The importance of critical thinking and choice making. *School Psychology Review*, 20(3), 382-388.

Kenner, C. (2004). *Becoming biliterate: Young children learning different writing systems*. Trentham Books.Kenner, C., & Gregory, E. (2003). Becoming biliterate. In N. Hall, J. Larson, & J. Marsh (Eds.) *Handbook of early childhood literacy*. Thousand Oaks, CA: Sage.

Klahr, D., Zimmerman, C., & Jirout, J. (2011). Educational interventions to advance children’s scientific thinking. *Science*, *333*(6045), 971-975.

Kress, G. (2012). Perspectives on making meaning: The differential principles and means of adults and children. *The SAGE Handbook of Early Childhood Literacy*, 329.

Kress, G. (2003). Perspectives on making meaning: The differential principles and means of adults and children. In J. Larson, & J. Marsh (Eds.), *The SAGE handbook of early childhood literacy*, (2nd ed.), (pp. 329-345). London: SAGE Publications Ltd.

Kress, G. (1997). *Rethinking writing: Rethinking the paths to literacy.* London: Routledge.

Kress, G., & Jewitt, C. (2003). Introduction. In C. Jewitt & G.K. Ress (Eds.), *Multimodal literacy*, (pp. 1-18). New York: Peter Lang.

Kuhn, D. (2015). Thinking together and alone. *Educational researcher*, *44*(1), 46-53.

Ladson-Billings, G. (2000). Fighting for our lives: Preparing teachers to teach African American students. *Journal of Teacher Education*, 51, 206–214.

Lampert, M., Franke, M.L., Kazemi, E., Ghousseini, H., Turrou, A.C., Beasley, H., Cunard, A., & Crowe, K. (2013). Keeping it complex using rehearsals to support novice teacher learning of ambitious teaching. *Journal of Teacher Education*, 64(3), 226-243.

Lave, J. (1988). *Cognition in practice: Mind, mathematics and culture in everyday life*. Cambridge, UK: Cambridge University Press.

Lave, J., & Wenger, E. (1998). *Communities of practice: The organizational frontier.* http:// www.rareplanet.org/sites/rareplanet.org/files/Communities_of_Practice__The_Organizational_Frontier%5B1%5D.pdf. Retrieved June, 9, 2008.

Lee, C.D. (1995). A culturally-based cognitive apprenticeship: Teaching African American high school students skills in literary interpretation. *Reading Research Quarterly*, 30, 608−630.

Lee, J. S., Hill-Bonnet, L., & Gillispie, J. (2008). Learning in two languages: Interactional spaces for becoming bilingual speakers. *International Journal of Bilingual Education and Bilingualism, 11*(1), 75-94.

Lockhart, S. (2010). Play: An important tool for cognitive development. *HighScope Extensions*, 24(3), 1–17.

Long, S., Volk, D., & Gregory, E. (2007). Intentionality and expertise: Learning from observations of children at play in multilingual, multicultural contexts. *Anthropology and Education Quarterly,* 38(3), 329–359.

Los Angeles Times. (2014). *Mapping L.A. neighborhoods*. Retrieved from http://maps.latimes.com/ neighborhoods/

Macmillan, A. (2002). Numeracy play: How mathematical is it? *Australian Primary Mathematics Classroom*, 7(4), 9-15.

MacSwan, J. (2017). A multilingual perspective on translanguaging. *American Educational Research Journal*, 54(1), 167-201.

Makalela, L. (2013). Translanguaging in kasi-taal: Rethinking old language boundaries for new language planning. *Stellenbosch Papers in Linguistics Plus*, 42(1), 111-125.

Marsh, J. (1999). Batman and Batwoman go to school: Popular culture in the literacy curriculum. *International Journal of Early Years Education*, 7(2), 117-131.

Martin-Beltran, M. (2014). "What do you want to say?" How adolescents use translanguaging to expand learning opportunities. *International Journal of Multilingual Research*, 8, 208–230.

Martin-Beltrán, M., Guzman, N.L., & Chen, P.J.J. (2017). Let's think about it together: How teachers differentiate discourse to mediate collaboration among linguistically diverse students. *Language Awareness*, 26(1), 41-58.

Martínez, R. A. (2016). Continuing to imagine deficiency: The persistence of deficit discourses about Latinx children and parents. Paper presented at the annual meeting of the Literacy Research Association, Nashville, TN.

Martínez, R.A. (2010). Spanglish as literacy tool: Toward an understanding of the potential role of Spanish-English code-switching in the development of academic literacy. *Research in the Teaching of English*, 45(2), 124–149.

Martínez, R.A. (2009). *Spanglish is spoken here: Making sense of Spanish-English code-switching and language ideologies in a sixth-grade English language arts classroom*. University of California, Los Angeles.

Martínez, R.A., Durán, L., & Hikida, M. (forthcoming). In I. García-Sánchez & M.F. Orellana, (Eds.), *Language and cultural practices in communities and schools: Bridging learning for students from non-dominant groups.* New York: Routledge.

Martinez, R.A., Orellana, M.F., Pacheco, M., & Carbone, P. (2008). Found in translation: Connecting translating experiences to academic writing. *Language Arts*, 85(6), 421-431.

Matsuda, P. K. (2013) It's the Wild West out there: A new linguistic frontier in U.S. college composition. In A.S. Canagarajah (Ed.), *Literacy as translingual practice: Between communities and classrooms*, (pp. 128–138). New York: Routledge.

McDonald, M., Kazemi, E., & Kavanagh, S.S. (2013). Core practices and pedagogies of teacher education a call for a common language and collective activity. *Journal of Teacher Education*, 64(5), 378-386.

Mejia-Arauz, R., Rogoff, B., Dayton, A., & Henne-Ochoa, R. (2018). Collaboration or negotiation: Two ways of interacting suggest how shared thinking develops. *Current opinion in psychology*, 23. DOI:10.1016/j.copsyc.2018.02.017

Melo-Pfeifer, S. (2015). Multilingual awareness and heritage language education: children's multimodal representations of their multilingualism. *Language Awareness*, *24*(3), 197-215.

Mercer, N. (2004). Sociocultural discourse analysis: Analyzing classroom talk as a social mode of thinking. *Journal of Applied Linguistics*, 1(2), 137–168.

Mercer, N. & Littleton, K. (2007). *Dialogue and the development of children's thinking: A sociocultural approach*. London: Routledge.

Merriam-Webster Dictionary Online. Retrieved from: https://www.merriam-webster.com/dictionary/activity

Miller, E., & Almon, J. (2009). *Crisis in the kindergarten: Why children need to play in school.* College Park, MD: Alliance for Childhood.

Miller, P.J. & Sperry, D.E. (2012). Déjà vu: The continuing misrecognition of low-income children's verbal abilities. In S.T. Fiske & H.R. Markus (Eds.), *Facing social class: How societal rank influences interaction*, (pp. 109–130). New York: Russell Sage.

Moje. E.B. (2008). Everyday funds of knowledge and school discourses. In M. Martin-Jones & A. Mejia (Eds.), *Encyclopedia of Language and Education*, vol. 3, (pp. 341-355). Berlin: Springer BPR.

Moll, L.C., Amanti, C., Neff, D., & Gonzalez, N. (1992). Funds of knowledge for teaching: Using a qualitative approach to connect homes and classrooms. *Theory into Practice*, 31(2), 132-141.

Moschkovich, J. (2013). Principles and guidelines for equitable mathematics teaching practices and materials for English language learners. *Journal of Urban Mathematics Education*, 6(1), 45-57.

Moschkovich, J. (2007). Using two languages when learning mathematics. *Educational Studies in Mathematics*, 64(2), 121-144.

Moschkovich, J. (2002). A situated and sociocultural perspective on bilingual mathematics learners. *Mathematical Thinking and Learning*, 4(2-3), 189-212.

Moschkovich, J. (1999). Supporting the participation of English language learners in mathematical discussions. *For the Learning of Mathematics*, 19(1), 11-19.

Mottweiler, C.M., & Taylor, M. (2014). Elaborated role play and creativity in preschool age children. *Psychology of Aesthetics, Creativity, and the Arts*, 8, 277-286.

Nasir, N. I. S. (2002). Identity, goals, and learning: Mathematics in cultural practice. *Mathematical Thinking and Learning*, *4*(2-3), 213-247.

Nasir, N. (2000). Points ain't everything: Emergent goals and average and percent understandings in the play of basketball among African-American Students. *Anthropology and Education Quarterly*, 31(3): 283-305.

Nasir, N.I.S., Hand, V., & Taylor, E.V. (2008). Culture and mathematics in school: Boundaries between "cultural" and "domain" knowledge in the mathematics classroom and beyond. *Review of Research in Education*, 32(1), 187-240.

National Clearinghouse on English Language Acquisition. (2010). *NCELA state title III information system*. Retrieved from http:// www.ncela.us/t3sis

National Council of Teachers of Mathematics. (1989). *Curriculum and evaluation standards for school mathematics.* Reston, VA: NCTM.

National Research Council (2009). *Mathematics learning in early childhood: Paths toward excellence and equity.* Washington, DC: National Academy Press.

New London Group (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review*, 66 (1), 60-92.

Nieto, S. (2000). Placing equity front and center: Some thoughts on transforming teacher education for a new century. *Journal of Teacher Education*, 51, 180–187.

Nunes, T. (1992). Ethnomathematics and everyday cognition. *Handbook of research on mathematics teaching and learning*, 557-571.

Nunes, T., Schliemann, A. and Carraher, D. (1988) Mathematical concepts in everyday life. In G.B. Saxe and M. Gearhart (Eds.), *Children's mathematics: New directions for child development 41*. San Francisco: Josey-Bass.

Orellana, M.F. (2016). *Immigrant children in transcultural spaces: Language, learning, and love*. New York: Routledge.

Orellana, M.F. (2009). *Translating childhoods: Immigrant youth, language, and culture*. New Brunswick, NJ: Rutgers University Press.

Orellana M.F. (1994). Appropriating the voices of superheroes: Three preschoolers' bilingual language use in play. *Early Childhood Research Quarterly*, 9, 171–193.

Orellana, M., Franco, J., Johnson, S.J., Rodriguez, B. Rodriguez-Minkoff, A., & Rodriguez, L. (2019). Transforming practice in multilingual communities: Towards a transcultural pedagogy of heart and mind. In P. Pacheco & Z. Morales, (Eds.), *Transforming schooling for second language learners: Policies, pedagogies and practices*. Charlotte, NC: Information Age Publishing.

Orellana, M., Johnson, S.J., Rodriguez, A., Rodriguez, L., & Franco, J. (2017). Pre-service teachers learning to see and seeing to learn. *Teacher Education Quarterly*, vol. 44, No. 2 (Spring 2017).

Orellana, M.F., & Hernandez, A. (1999). Talking the walk: Children reading urban environmental print. *The Reading Teacher*, 52(6), 612-619.

Orellana, M.F., Johnson, S. J., Rodriguez-Minkoff, A. C., Rodriguez, L., & Franco, J. (2017). An apprentice teacher's journey in "seeing learning." *Teacher Education Quarterly*, 44(2), 7-26.

Orellana, M.F., & Peer, K. (2013). Methodologies of early childhood research. In J. Larson & J.Marsh (Eds.), *The SAGE Handbook of Early Childhood Literacy* (2nd ed.). Los Angeles: SAGE.

Orellana, M.F., & Reynolds, J.F. (2008). Cultural modeling: Leveraging bilingual skills for school paraphrasing tasks. *Reading Research Quarterly*, *43*(1), 48-65.

Orellana, M. F., & Rodriguez-Minkoff, A. C. (2016). Cultivating linguistic flexibility in contexts of super-diversity. *International Journal of the Sociology of Language*, 2016 (241), 125-150.

Pacheco, M.B., & Smith, B.E. (2015). Across languages, modes, and identities: Bilingual adolescents' multimodal codemeshing in the literacy classroom. *Bilingual Research Journal*, 38(3), 292-312.

Palmas, S. (2016) Diferentes aproximaciones al concepto de *numeracy*: Relaciones y fronteras. *Decisio* (45) Septiembre – Diciembre 2016, 75-80. CREFAL-UNESCO. Retrieved from: :http://www.crefal.edu.mx/decisio/images/pdf/decisio-45/decisio-45-ahora- que.pdf

Papageorgiou, V., & Lameras, P. (2017). *Multimodal teaching and learning with the use of technology: Meanings, practices, and discourses*. International Association for Development of the Information Society Conference on Cognition and Exploratory Learning in Digital Age, Algarve, Portugal.

Paris, C., & Lung, P. (2008). Agency and child-centered practices in novice teachers: Autonomy, efficacy, intentionality, and reflectivity. *Journal of Early Childhood Teacher Education*, 29(3), 253-268.

Park, M.S. (2013). Code-switching and translanguaging: Potential functions in multilingual classrooms. *Teachers College, Columbia University Working Papers in TESOL & Applied Linguistics*, vol. 13, no. 2, pp. 50-52.

Parks, A.N., & Chang, D.B. (2012). *Supporting preschool students' engagement in meaningful mathematics through play.* American Education Research Association Annual Meeting. Vancouver.

Pellegrini, A D. (2009). Research and policy on children's play. *Child Development Perspectives*, 3, 131–136.

Pellegrini, A.D., & Bohn, C.M. (2005). The role of recess in children's cognitive performance and school adjustment. *Educational Researcher*, 34(1), 13-19.

Pellegrini, A.D. & Galda, L. (1982). The effects of thematic-fantasy play training on thedevelopment of children's story comprehension. *American Educational Research Journal*, 19, 443–452.

Pérez, B. (2004). Literacy, diversity, and programmatic responses. In *Sociocultural contexts of language and literacy* (pp. 15-36). Routledge.

Perry, B., & Dockett, S. (2008a). What makes mathematics play? In L. Sparrow, B. Kissane, & C. Hurst (Eds.), *Shaping the future of mathematics education: Proceedings of the 33rd annual conference of the Mathematics Education Research Group of Australasia*, (pp. 715–718). Adelaide: MERGA.

Perry, B., & Dockett, S. (2008b). Young children's access to powerful mathematical ideas. In L. D. English (Ed.), *Handbook of international research in mathematics education*, (2nd ed., pp. 75–108). New York: Routledge.

Perry, B., Dockett, S., & Harley, E. (2012). The early years learning framework for Australia and the Australian curriculum – mathematics: Linking educators' practice through pedagogical inquiry questions. In B. Atweh, M. Goos, R. Jorgensen, & D. Siemon (Eds.), *Engaging the Australian curriculum mathematics: Perspectives from the field*, (pp. 153–174). Adelaide: MERGA. Retrieved from http://www.merga.net.au/onlinebooks.

Piaget, J. (1970). *Science of education and the psychology of the child*. (D. Coltman, trans.). New York: Orion Press.

Pontier, R., & Gort, M. (2016). Coordinated translanguaging pedagogy as distributed cognition: A case study of two dual language bilingual education preschool coteachers' languaging practices during shared book readings. *International Multilingual Research Journal*, 10(2), 89-106.

Poza, L.E. (2018). The language of ciencia: Translanguaging and learning in a bilingual science classroom. *International Journal of Bilingual Education and Bilingualism*, 21(1), 1-19.

Pruden, S.M., Levine, S.C., & Huttenlocher, J. (2011). Children's spatial thinking: Does talk about the spatial world matter?. *Developmental Science*, 14(6), 1417-1430.

Ramani, G.B., & Siegler, R. S. (2008). Promoting broad and stable improvements in low-income children's numerical knowledge through playing number board games. *Child Development*, 79, 375–394. DOI: 10.1111/j.1467-8624.2007.01131.x

Razfar, A. & Gutiérrez, K. (2003) Reconceptualizing early childhood literacy: The Sociocultural Influence. In N. Hall, J. Larson, & J. Marsh (Eds.), *Handbook of early childhood literacy*. Thousand Oaks, CA: Sage.

Reyes, I. (2006). Exploring connections between emergent biliteracy and bilingualism. *Journal of early childhood literacy*, *6*(3), 267-292.

Reyes, I. (2001). *The development of grammatical and communicative competence in bilingual Spanish speaking children* (Doctoral dissertation). University of California, Berkeley.

Reyes, I., Da Silva Iddings, A. C., & Feller, N. (2016). Building relationships with diverse students and families: A funds of knowledge perspective. *Journal of Early Childhood Literacy*, *16*(1), 8-33.

Reynolds, A., Ou, S., & Topitzes, J.W. (2004). Paths of effects if early childhood intervention on educational attainment and delinquency: A confirmatory analysis of the Chicago Child-Parent centers. *Child Development*, 75, 1299–1328.

Rodriguez, G. M. (2013). Power and agency in education: Exploring the pedagogical dimensions of funds of knowledge. *Review of Research in Education*, *37*(1), 87-120.

Rogoff, B. (1994). Developing understanding of the idea of communities of learners. *Mind, Culture, and Activity*, 1(4), 209-229.

Rogoff, B., Coppens, A.D., Alcalá, L., Aceves-Azuara, I., Ruvalcaba, O., López, A., & Dayton, A. (2017). Noticing learners' strengths through cultural research. *Perspectives on Psychological Science*, 12(5), 876-888.

Rosa, M. & Orey, D. C.(2001). Ethnomathematics: The cultural aspects of mathematics. *Revista Latinoamericano de Etnomatemática,* 4(2). 32-54.

Roskos, K. (1988). Literacy at work in play. *Reading Teacher* 41:562–566.

Roskos, K., & Christie J. (2001). Examining the play-literacy interface: A critical review and future directions. In E.F. Zigler, D.G. Singer, & S.J. Bishop-Josef (Eds.), *Children's play: Roots of reading*. Washington DC; Zero to Three Press.

Roskos, K. & Christie, J. (Eds.). (2000). *Play and literacy in early childhood: Research from multiple perspectives*. Mahwah, NJ: Lawrence Erlbaum.

Rowe, D. (2000). Bringing books to life: The role of book-related dramatic play in young children's literacy learning. In K. Roskos & J. Christie (Eds.), *Play and literacy in early childhood: Research from multiple perspectives*. Mahwah, NJ: Lawrence Erlbaum.

Rubinstein-Ávila, E., Sox, A. A., Kaplan, S., & McGraw, R. (2015). Does biliteracy + mathematical discourse = binumerate development? Language use in a middle school dual-language mathematics classroom. *Urban Education*, 50(8), 899-937.

Saxe, G. (1991). *Culture and cognitive development: Studies in mathematical understanding*. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Schwartzman, H.B. (Ed.). (1980). *Play and culture: 1978 proceedings of the Association for the Anthropological Study of Play*. New York: Leisure Press.

Schweinhart, L.J. (2004). *The High/Scope Perry preschool study through age 40: Summary, conclusions, and frequently asked questions*. Ypsilanti, MI: High/Scope Educational Research Foundation.

Schwerdtfeger, J.K., & Chan, A. (2007). Counting collections. Teaching Children Mathematics, 13, 356-361.

Seo, K.H., & Ginsburg, H.P. (2004). What is developmentally appropriate in early childhood mathematics education? Lessons from new research. In D.H. Clements, J. Sarama, & A.M. DiBiase, (Eds.), *Engaging young children in mathematics: Standards for early childhood mathematics education*, (pp. 91-104). Mahwah, NJ: Lawrence Erlbaum Associates.

Sfard, A. (2008). *Thinking as communicating: Human development, the growth of discourses, and mathematizing*. Cambridge, UK: Cambridge University Press.

Siegel, M. (2006). Rereading the signs: Multimodal transformations in the field of literacy education. *Language Arts*, 84(1), 65.

Siegler, R.S. (2009). Improving the numerical understanding of children from low-income families. *Child Development Perspectives*, 3(2), 118–124.

Siegler, R.S., & Ramani, G.B. (2008). Playing linear numerical board games promotes low-income children's numerical development. *Developmental Science*, 11(5), 655–661.

Siraj-Blatchford, I., & Sylva, K. (2004). Researching pedagogy in English preschools. *British Educational Research Journal,* 30 (5), 713-730.

Sleeter, C.E. (2008). Preparing White teachers for diverse students. In M. Cochran-Smith, S. Feiman-Nemser, & D. John McIntyre (Eds.), *Handbook of research on teacher education: Enduring questions in changing contexts* (3rd ed.), pp. 559–582. New York: Routledge.

Smith, P., & Pellegrini, A. (2013). Learning through play. In R.E. Tremblay, R.G. Barr, R.D. Peters, & M. Boivin (Eds.), *Encyclopedia on early childhood development*, pp. 1–6. Montreal: Centre of Excellence for Early Childhood Development.

Speier, M. (1976). The adult ideological viewpoint in studies of childhood. *Rethinking childhood: Perspectives on development and society*, 168-186.

Spradley, J. P. (1979). *The ethnographic interview*. New York: Holt, Rinehart, & Winston.

Stanford Center for Assessment, Learning, & Equity (SCALE). (2018). *Understanding academic language in edTAP: Supporting Learning Language Development* (Handout). DOI: http:// soeport.cwpost.liu.edu/Certification/EdTPA/Archive2746/edtpa-al-pfa.pdf.

Stecher, B. M. (2002). *Consequences of large-scale, high-stakes testing on school and classroom practice*. In L.S. Hamilton, S.P. Klein, & B.M. Stecher Rand (Eds.), *Making sense of test-based accountability in education*, pp. 79–100. Santa Monica: Rand Corporation.

Steen, L.A. (2004, April 7). Back to the future in mathematics education. *Education Week*. Retrieved from https://www.edweek.org/ew/articles/2004/04/07/ 30steen.h23.html

Thomas, L., Warren, E., & deVries, E. (2011). Play-based learning and intentional teaching in early childhood contexts. *Australasian Journal of Early Childhood*, 36(4), 69-75.

Thorne, B. (1993). *Gender play: Girls and boys in school*. New Brunswick, NJ: Rutgers University Press.

Torrance, H., & Pryor, J. (1998). *Investigating formative assessment: Teaching, learning and assessment in the classroom*. Berkshire, UK: McGraw-Hill Education.

Trawick-Smith, J. (2001). The play frame and the "fictional dream": The bidirectional relationship between metaplay and storywriting. In S. Reifel & M. Brown (Eds.), *Early education and care, and reconceptualizing play*, pp. 339–355. New York: JAI Press.

Tudge, J. R.H., & Doucet, F. (2004). Early mathematical experiences: Observing Black and White children's everyday activities. *Early Childhood Research Quarterly*, 19(1), 21–39.

Tuhiwai Smith, L. (2005). *Decolonizing methodologies: Research and indigenous peoples*. London: Zed Books.

Valdés, G. (2001). *Learning and not learning English: Latino students in American schools*. New York: Teachers College Press.

Van Oers, B. (2010). Emergent mathematical thinking in the context of play. *Educational Studies in Mathematics*, 74, 23–37.

Vásquez, O.A. (2003). *La Clase Mágica: Imagining optimal possibilities in a bilingual learning community of learners*. Mahwah, NJ: Erlbaum.

Velasco, P., & García, O. (2014). Translanguaging and the writing of bilingual learners. *Bilingual Research Journal*, 37(1), 6-23.

Vertovec, S. (2009). *Transnationalism*. Routledge.

Vertovec, S. (2007). Super-diversity and its implications. *Ethnic and Racial Studies*, 30(6), 1024-1054.

Vogel, S., & García, O. (2017). Translanguaging. In G. Noblit (Ed.), *Oxford Research Encyclopedia of Education*. Oxford, UK: Oxford University Press.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Wager, A.A. (2013). Practices that support mathematics learning in a play-based classroom. In L.D. English & J.T. Mulligan (Eds.), *Reconceptualizing early mathematics learning*, pp. 163-181. New York: Springer.

Wager, A.A., & Parks, A.N. (2016). Assessing early number learning in play. *ZDM*, 48(7), 991-1002.

Wager, A.A., & Parks, A.N. (November, 2015). *A toolbox for supporting early number learning in play: Moving beyond "how many?"* North American Chapter of the International Group for the Psychology of Mathematics Education Meeting, St. Louis, MO.

Wager, A.A., & Parks, A.N. (2014). Learning mathematics through play. In L. Brooker, M. Blaise, & S. Edwards (Eds.), *SAGE Handbook of play and learning in early childhood*, 216-227. Thousand Oaks, CA: SAGE.

Wang, Z., & Hung, L.M. (2010). Kindergarten children's number sense development through board games. *The International Journal of Learning*, 17(8), 19-31.

Wei, L. (2011). Moment analysis and translanguaging space: Discursive construction of identities by multilingual Chinese youth in Britain. *Journal of pragmatics*, *43*(5), 1222-1235.

Weikart, D. P. (1998). Changing early childhood development through educational intervention. *Preventive Medicine*, 27, 233–237.

Wohlwend, K. (2011). *Playing their way into literacies: Reading, writing, and belonging in the early childhood classroom*. New York: Teachers College Press.

Wohlwend, K. (2008). Play as a literacy of possibilities: Expanding meanings in practices, materials, and spaces. *Language Arts*, 86(2), 127.

Wohlwend, K., & Peppler, K. (2015). All rigor and no play is no way to improve learning. *Phi Delta Kappan*, 96(8), 22-26.

Wolcott, H. F. (2008). *Writing up qualitative research*. Sage Publications.

Wolcott, H.F. (1999). *Ethnography: A way of seeing*. Walnut Creek, CA: AltaMira Press.

Worthington, M. & Carruthers, E. (2003) *Children's Mathematics: making marks, making meaning.* London: Paul Chapman Publishing.

Yogman, M., Garner, A., Hutchinson, J., Hirsh-Pasek, K., Golinkoff, R.M., & Committee on Psychosocial Aspects of Child and Family Health. (2018). The power of play: A pediatric role in enhancing development in young children. *Pediatrics*, 142(3), e20182058.

Yun, S. (2008). Role-play and language socialization among bilingual Korean children in the United States. *Simulation & gaming*, 39(2), 240-252.

Zapata, A. & Tropp Laman, T. (2016). "I write to show how beautiful my languages are": Translingual writing instruction in English-dominant classrooms. *Language Arts*, 93(5), 366–378.

Zeichner, K. (2010). Rethinking the connections between campus courses and field experiences in college-and university-based teacher education. *Journal of Teacher Education*, 61(1-2), 89-99.

Zeichner, K., Bowman, M., Guillén, L., & Napolitan, K. (2016). Engaging and working in solidarity with local communities in preparing the teachers of their children. *Journal of Teacher Education*, 67(4), 277-290.

Zentella, A. C. (1997). *Growing up bilingual: Puerto Rican children in New York*. Malden, MA: Blackwell.

Zigler, E., Singer, D. G., & Bishop-Josef, S. J. (2004). *Children's play: The roots of reading.* Washington, DC: Zero to Three.

Zisselsberger, M. (2016). Toward a humanizing pedagogy: Leveling the cultural and linguistic capital in a fifth-grade writing classroom. *Bilingual Research Journal, 39*(2), 121-137.